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ABSTRACT

At the request of the Association of Research Libraries a study was made to develop, evaluate, and recommend a national plan for improving access to periodical resources. The following design features were established: (1) service should be available to all users with no restrictions other than access through a library; (2) initially, service would be primarily rapid, dependable delivery of photocopies of journal articles; (3) subject coverage should be comprehensive but exclude medicine; and (4) worthwhile journals in any language should be collected. Demand estimates and projected costs were compared for three alternative plans. A single national center was recommended as the best solution and various methods of implementation were suggested. (JG)

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ACCESS TO PERIODICAL RESOURCES: A NATIONAL PLAN

By

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ACCESS TO PERIODICAL RESOURCES

A National Plan

by

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for

The Association of Research Libraries
1527 New Hampshire Avenue, NW
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FOREWCRD

This report has been prepared at the request of the Association of Research Libraries with support from the National Science Foundation, which the Association is pleased to acknowledge. Members of the ARL Advisory Committee, the ARL staff and others have contributed in various ways to the conduct of the study and the preparation of the report.

The conclusions and recommendations of the report are those of the contractor. They do not necessarily represent the views of the Association of Research Libraries.

In light of the findings of this and other studies of the interlibrary loan problem, the Association expects to continue its study and consideration of the facilities and services proposed in this report. The potential impact of such services on the prompt and effective dissemination of information to library users and on library operations and funding are elements of major concern, as are the potential impacts on the methods of production and the economics of publication of periodical literature.

The many facets of this problem are not susceptible to easy analysis and simple solutions. The Association in cooperation with interested users and the professional groups involved will endeavor to work responsibly to achieve an effective program that will assure the prompt and unimpeded flow of information to our citizens.

Stephen A. McCarthy
Executive Director
Association of Research
Libraries

March 12, 1974

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WESTAT, INC.
February 1974

1. SUMMARY

The purpose of this study was to develop, evaluate and recommend a national plan for improving access to periodical resources. About 48 percent of all academic interlibrary loans are for periodical materials, with the bulk of the loans being satisfied in the form of photocopies. A major consideration in the long-range improvement of the interlibrary loan system is the possible augmentation with a national system for acquiring, storing, and satisfying loan requests for periodical materials.

This study focused on the physical access to the periodical literature. Based on the needs of the library community, design features were developed, and included the following:

- Service should be made available to all users without any restriction other than access through a library.
- Initially, the service should be confined primarily to rapid, dependable delivery of photocopies of journal articles.
- The collection of a center should be comprehensive in subject coverage excluding only medicine.
- All worthwhile journals should be collected irrespective of language.

Three basic configurations were developed and evaluated for a national periodicals system, (1) a single new facility with a comprehensive collection, National Periodical Resources Center, (2) a new multi-location national system based on a number of satellite resource centers with dedicated collections of the most heavily used titles, and a single new national center serving as the major resource in the system, and (3) a regional resource network based on designated existing library collections. The first

configuration is essentially the British model of the National Lending Library for Science and Technology. Both regional models have certain features in common with the Regional Medical Library Program of the National Library of Medicine.

Demand estimates were projected for each alternative configuration, as well as the total potential national demand for periodical materials. Cost estimates were developed for each configuration for a ten-year planning period. Based on the projected costs and satisfied demand, the alternatives were compared.

Based on the analysis of costs and other factors, a single national center appeared to offer the best solution over the long run. It is recommended that a National Periodical Resources Center with a comprehensive collection be developed to improve access to the periodical literature. Various strategies on the implementation of such a system are presented.

2. INTRODUCTION

2.1 Background

This study is one of several investigations sponsored by the Association of Research Libraries (ARL) that have focused on the improvement of the present interlibrary loan system. A plan was developed by the Interlibrary Loan Study Committee of ARL in 1970 for a series of proposed studies that would explore the problems of interlibrary loan and recommend solutions. In late 1970, ARL received a grant from the National Science Foundation (NSF) to pursue the first study designed to provide basic data on the magnitude, characteristics, and costs of academic interlibrary loans. The results of this research by Westat, Inc., were completed in late 1971 and subsequently published in early 1972.[1]

In April 1971, the ARL Board of Directors authorized the formation of the Periodical Resources Center Study Committee which was asked to review the concept of a national lending library for periodical materials. The Committee recommended a full feasibility study on the need for a national periodical interlibrary loan system.

Upon completion of the 1971 interlibrary loan study, the Interlibrary Loan Study Committee suggested to ARL a number of important problems that remained unexplored and that required solutions for planning at the national level. Their recommendations led to a second ARL study, funded by the NSF, to continue the study of an improved interlibrary loan system for academic

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[1] Palmour, Vernon E., Bryant, Edward C., Caldwell, Nancy W., and Gray, Lucy M., A Study of the Characteristics, Costs, and Magnitude of Interlibrary Loans in Academic Libraries, Westport, Connecticut: Greenwood Publishing Company, 1972.

libraries. This study consisted of three parts: an investigation of more equitable means for financing interlibrary loans, the determination of the feasibility of a national periodical resources system, and the investigation of an improved communications system between libraries for interlibrary loan using computers. The first part of the study on improved methods of financing interlibrary loans was conducted by Westat, Inc., and published[2] separately from this report, which addresses the second part of the overall study. Becker and Hayes, Inc., completed the third part of the study.[3] These three investigations have taken place in the last twelve months, commencing in December, 1972.

Another related study was the brief investigation by Stevens[4] for the ARL on the feasibility of centralized and regionalized interlibrary loan centers. The study, funded by the National Commission on Libraries and Information Science, had two primary objectives: to identify the major problems of the existing interlibrary loan system and recommend approaches to their solution, and to provide the Commission the necessary background information for a full-scale investigation of the development of a national center or a system of regional centers that would provide user access to library materials of all types not available locally. Subsequent to the Stevens study, Westat, Inc. was awarded a contract by the Commission to consider the role of regional resource centers and bibliographic centers in a national

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[2] Palmour, Vernon E., Olson, Edwin E., and Roderer, Nancy K., Methods of Financing Interlibrary Loan Services, Washington, D.C.: Association of Research Libraries, February 1974.

[3] Hayes, Robert M., A Study of a System for Interlibrary Communication (SILC), Washington, D.C.: Association of Research Libraries, February 1974.

[4] Stevens, Rolland E., A Feasibility Study of Centralized and Regionalized Interlibrary Loan Centers, Washington, D.C.: Association of Research Libraries, April, 1973.

network of information services. This latter study is currently in progress and is due for completion in June 1974.

2.2 Problem

The earlier study, sponsored by the Association of Research Libraries and supported by the National Science Foundation, showed that the volume of interlibrary lending by academic libraries had more than doubled in five years and was expected to increase by 50 percent in the next five years.[5] The rapid growth in lending places a differential burden on academic libraries, depending on size, location, and other factors. As originally conceived, interlibrary lending and borrowing were to be reciprocal operations, extending the available collections to patrons without placing an undue burden on any particular institution. In practice, the lending burden is falling so heavily upon a relatively few institutions that the interlibrary loan system is endangered.

It was found, for example, that large academic libraries--those with collections of over 500,000 volumes--receive about three times as many requests as they place with other libraries. Thus, the lending-borrowing ratio is about three to one. The very large university libraries within this group have much higher ratios. It is not unusual for ratios to be ten to one and in some cases still higher. These ratios show that the reciprocal concept is not working for large academic libraries.

There is a tendency for some interlibrary borrowers to send their requests automatically to certain larger libraries. The resulting unevenness in the lending load has required substantial expenditures by many large lending libraries and has

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[5] Palmour, Vernon E., Op. cit. (1972), pp. 50-52.

led to long delays in obtaining materials. Some libraries have reached the point where the librarians and administrators are questioning their continued contribution to the present interlibrary loan system. Under such conditions, the dependability of the present system is growing continuously worse.

The bulk of the interlibrary loan load consists of borrowing and lending periodicals and monographs. Improvements must be sought for the handling of both kinds of material. Feasible solutions to the current interlibrary loan problems will probably differ for the lending of books and the lending of periodicals (or supplying copies of periodical materials).

Rapid and efficient access to periodicals is a growing problem. About 48 percent of all loans sent out by academic libraries are periodicals or photocopies of articles from periodicals. The phenomenal increase in the number of scholarly journals published and in subscription costs has made it impossible for libraries, even the largest, to collect and make available all of the journals their users may need. A recent survey of a selected group of large libraries indicates that periodical subscriptions are taking a substantially greater percentage of library acquisitions funds than they did only a few years ago. The gap between the ability to collect and the volume of potentially valuable material is widening each year.

There is a growing concern among librarians that the solution to the interlibrary loan problem should be sought on a national level. Clearly, some revisions in the existing interlibrary loan system are needed. These revisions need to be considered soon. Otherwise, large libraries with a heavy volume of interlibrary lending are likely to take unilateral action that will complicate the analysis and evaluation of alternative options

on a national level. Unilateral decisions may precipitate actions by other libraries and policymakers that could place the entire system in jeopardy.

An improved interlibrary loan system would benefit public, school, and special libraries, as well as academic libraries, because the entire library community is involved in the interlibrary loan system, and borrowing and lending are carried on among all the different types of libraries. Further, an improved system would not only lead to better access for all, but also it could help relieve the severe budgetary pressures now being felt by every library at a time when the public is demanding that libraries be more responsive to individual information needs.

2.3 Study Objectives

The primary purpose of the study was to develop, evaluate, and make recommendations on feasible configurations of a national periodical resources system as a method of improving the interlibrary loan system. The study focused on physical access to the periodical literature. Development of a national plan was to provide long-range improvement and enhance the economic viability of the interlibrary loan system.

Assuming that a national periodical resources system was shown to be feasible, the anticipated output of the study was to provide data and recommendations that would allow the establishment of a national system to be started. Several alternative configurations of a national system that could be considered for adoption were to be investigated and reported.

2.4 Study Approach

Using the data base generated in the earlier ARL interlibrary loan study, a description of current patterns in lending and borrowing of periodical materials was developed. From this existing data base, future demand for periodicals was estimated. Armed with the descriptive profile of current lending activities, Westat staff made visits to a number of libraries and library systems to solicit attitudes and opinions of librarians on their perceived needs. In order to supplement the personal visits and interviews, a mail survey was conducted. Questionnaires were sent to a probability sample of academic libraries asking for the directors' and interlibrary loan librarians' views on interlibrary loan.

From the background material gathered as described above, the design elements of a national periodical resources system were specified. Analyzing the design elements in light of the goals and objectives of a system, various configurations were constructed. These configurations were developed around two basic concepts: (1) a totally new system with dedicated periodical materials, and (2) a system based primarily on the use of existing library collections.

Service levels and costs were estimated for the most promising configurations. Demand and annual costs were projected over a ten-year planning period. Configurations are compared and recommendations given on the system for possible implementation. Sponsorship, funding, and management of a national system were investigated and reported.

3. INTERLIBRARY LENDING OF PERIODICAL MATERIALS

In the previous chapter, we saw that requests for periodical materials make up about half of the total interlibrary loan requests received by academic libraries. The purpose of this chapter is to describe the characteristics of the loan requests and the amount of interlibrary lending of periodical materials, and to conclude with a discussion on the need for improvement of the ILL system at the national level. From this overview of the existing interlibrary loan system, as it pertains to the periodical literature, we can proceed to the design and consideration of alternative improvements for the supply of materials.

The growth in scientific literature and the advent of satisfactory means for reproduction of periodical materials by photocopy equipment has resulted in tremendous growth in the exchange of periodical materials between libraries. In the case of academic libraries, about 48 percent of all interlibrary loans are for periodical materials and 83 percent of these periodical loans are in the form of photocopies in lieu of the original materials.[1] Providing a photocopy to satisfy a loan request has the important advantage of not removing the journal or item from the lending library. The user also benefits from receiving a copy that can be marked-up in lieu of handwritten notes.

3.1 Previous Studies

The design of a national system for periodical materials requires an understanding of the needs of users. A starting

[1] Palmour, Vernon E., Bryant, Edward C., Caldwell, Nancy W., and Gray, Lucy M., A Study of the Characteristics, Costs, and Magnitude of Interlibrary Loans in Academic Libraries, Westport, Connecticut: Greenwood Publishing Company, 1972, p. 44.

point for the identification of user needs is the existing interlibrary loan traffic. Ideally, it would be desirable to know the needs of users as expressed by their requests upon all types of libraries, academic, public, special and government. Data of this type are not available on a national basis. The best available data appear to be those derived from national studies of academic libraries. One might reason that academic libraries are now serving what a national system would, if one existed. Large academic libraries who are lending 20,000 - 30,000 items annually to other libraries are operating, in part, as a de facto national collection. Another strong reason for believing that the periodical loan requests being handled by the academic libraries are representative of national needs is the fact that these requests originate in all types of libraries. Many special libraries have arrangements to borrow materials from academic libraries. Likewise, public libraries have increased their use of literature available in academic libraries. State systems and consortia have contributed to this by their inclusion of public and academic libraries into the same cooperative systems.

Data presented in this chapter originated, for the most part, in two earlier studies, the Westat/ARL investigation[2] and Wood's[3] study of interlibrary lending of scientific and technical materials. Data analyzed in the Westat/ARL study included monographs, periodicals, theses and other types of publications. The data base was developed from a probability sample of loan requests received by 71 academic libraries. Approximately 2,330 sample loan requests received by the libraries were for periodical materials. On an annual basis, the sample represented a total of about 933,000

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[2] Ibid.

[3] Wood, James L., A Review of the Availability of Primary Scientific and Technical Documents Within the United States, Vols. I-III, Columbus, Ohio: Chemical Abstracts Service, 1969.

interlibrary loan requests for periodical materials received by all academic libraries in the U.S. A precaution is required in the interpretation of this estimate; it represents an estimate of the total number of interlibrary loan requests for periodical materials received by the interlibrary loan office or department in academic libraries. While the number is not available, we know that some of the larger university libraries have a special arrangement outside their traditional interlibrary loan office to process certain photocopy requests, e.g., service to industry handled directly by a photocopy department. Because of this and probably other reasons we know the estimate of 933,000 loan requests is low.

Tables that follow on characteristics of loan requests are based on the sample requests that were made for periodical materials in early 1970. For a fuller explanation of the sampling methodology and data collection forms used, the reader is referred to Appendices B and D of the published study.[4]

An earlier study by Wood[5] was directed specifically at serials and conference reports to determine their availability to users in the United States. It was also designed to measure the effectiveness of the present interlibrary loan system. Wood's main conclusions were (1) scientific and technical serials and conference proceedings volumes are not widely enough available to users in the United States; (2) the borrowing of such documents through interlibrary loan is both uncertain and time-consuming; and (3) specialized document collections are needed as backup resources for the library community.

Wood collected a very large sample of 62,634 interlibrary loan requests which represented approximately 10 percent of the

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[4] Palmour, Vernon E., Op. cit.

[5] Wood, James L., Op. cit.

requests either generated or received by each of 19 resource libraries in 1967. A second sample of 8,052 requests were collected in each of the 19 participating libraries in early 1968. The second sample had supplemental data added so that intralibrary performance characteristics could be judged. For analysis of characteristics the two samples were combined.

3.2 Characteristics of Loan Requests for Periodical Materials

The tables presented in this section are based on the Westat/ARL 1970 data base with appropriate comparisons drawn from the Wood study. A geographical flow of interlibrary loan requests was constructed and is shown in Table 3-1. Four geographic regions corresponding to the four-region scheme defined by

Table 3-1. Geographical flow pattern* of periodical loans by regions (percent of total requests)

Loaning region (x)	Requesting region (y)				
	1	2	3	4	Other
1. Northeast	88.3	3.3	4.7	1.7	2.0
2. North Central	2.6	77.6	8.5	7.3	4.0
3. South	2.0	6.9	89.0	1.5	0.6
4. West	1.2	3.6	3.0	87.8	4.4

* The entry in each (x,y) cell is the flow of periodical loan requests from region y to region x; e.g., the (2,1) cell indicates that 2.6 percent of the requests received in region 2 originated in region 1.

the U.S. Census Bureau were used. A high percentage of requests for materials received by a lending library is from other requesting libraries in the same region. Wood found similar results using the nine regions of the U.S. Office of Education.

About 71 percent of all periodicals requests originate in the same state as the lending library, Table 3-2. It is important in viewing these tables to gain the correct perspective in that the figures were derived from loan requests received by the sample libraries. In other words, we are viewing the lending activities of academic libraries, not their borrowing activities. Of course, a loan request received by a lending library is in turn a borrowing request for the library making the request. If we had a closed system, in which academics only lent to other academics, the lending and borrowing activities would be mirror images. This is not the case, and since the sample included only academic libraries we need to distinguish between lending and borrowing.

In Table 3-2 we noted that about 71 percent of loan requests originate in the same state as the lending library. On the other hand, the academic libraries make only about 55 percent of their borrowing requests in the same state. In fact, for the large academic libraries (total collection size of 500,000 volumes and over), approximately 62 percent of their requests to borrow items go out of state.

Table 3-2. Percent of periodical loan requests received from in-state and out-of-state libraries by collection size of lending library

Collection size of lending library (total volumes)	Percent of loan requests originating		Total loan requests (000's)
	In-state	Out-of-state	
20,000 - 99,999	75.3	24.7	43
100,000 - 499,999	85.7	14.3	155
500,000 and over	67.6	32.4	735
Total loans	70.9	29.1	933

In this section we will continue to distinguish between the lending activities and borrowing activities of the academic libraries. Their lending activities give a broader view of the needs as expressed in the interlibrary loan traffic since they are the major resource libraries for periodical materials. It is for this reason that the primary tables displayed represent the lending activities of academic libraries, with only secondary statements on their borrowing needs. One could argue for a reverse presentation on the grounds that the need to borrow periodical materials by academic libraries is more relevant to the design of a national periodicals resource. We have chosen the lending perspective primarily on the basis that it represents almost twice the amount of interlibrary loan traffic for periodical materials. In 1970 we estimated that about 933,000 loan requests for such materials were received by academic libraries; this can be contrasted with about 500,000 borrowing requests sent out by academic libraries for periodical materials.

The types of libraries making loan requests, from academic libraries, by broad subject area, is displayed in Table 3-3. Only 43 percent of the requests received for periodicals in science and technology was from other academic libraries. In contrast, 80 percent of the outgoing requests from academic libraries to borrow these same materials is to other academic libraries. Table 3-3 also shows that about one-half of all requests for periodical materials received by academic libraries are from other academic libraries; from the borrowing side, about 84 percent of the total borrowing requests for academic libraries are to other academic libraries. Wood found a much higher percentage of loans in science and technology going to industry. Caution should be used in relating the Wood data since he combined loan requests received and borrowing requests made by his sample libraries.

Table 3-3. Type of requesting library by subject of periodical request (percent of total requests in each subject)

Subject	Percent by type of requesting library						Total loan requests (000's)
	Academic	Government	Societies and research foundations	Industrial and business	Public	Other	
Humanities	86.8	3.1	0.9	0.3	7.1	1.8	137
Social Science	76.0	6.6	1.3	4.8	3.1	8.2	120
Science & Technology	42.9	11.3	5.3	14.9	2.3	23.3	515
Other	19.0	3.4	3.1	4.0	2.5	68.0	150
Total	49.9	8.2	3.7	9.7	3.1	25.4	922
Wood Data	31.0	7.0	5.5	50.0	0.5	6.0	

If we look at just the broad subject area of all periodical items requested from academic libraries, we find the following:

Social science	13 percent
Humanities	15 percent
Science and Technology	56 percent
Other	16 percent

The subject area and language of periodical items requested from academic libraries are shown in Table 3-4. Again in Table 3-5, subject area is contrasted with date of publication for items requested.

The form of material requested is shown in Table 3-6 with about 83 percent of all requests satisfied by photocopy in lieu of loan of original material. On the average, about 80 percent of requests received by academic libraries for periodical materials are filled. The lowest fill rate is in the social sciences as indicated in Table 3-7. Outcome of requests in terms of the language of item requested is available in Table 3-8. Russian has the lowest success rate. Reasons for periodical requests not being filled, by subject, are presented in Table 3-9.

3.3 Demand for Periodical Materials

An important input into the planning of a national periodical resources system is the estimated demand. In this section estimates will be given of the current demand, and future demand for periodical materials will be forecasted based on the present interlibrary loan system.

Table 3-4. Subject and language of periodical items requested for loan (percent of total requests in each subject)

Subject	Percent by language								Total loan requests (000's)
	English	German	French	Russian	Spanish	Italian	Other	Unknown	
Humanities	71.1	7.3	13.1	0.5	4.1	2.6	1.2	0.1	136
Social Science	89.4	2.5	4.1	0.8	2.7	0.1	0.4	---	119
Science & Technology	84.1	5.6	3.3	2.1	0.5	1.5	2.6	0.3	517
Other	93.8	3.2	1.8	0.2	0.5	0.1	0.3	0.1	149
Total	84.4	5.1	4.6	1.4	1.3	1.3	1.7	0.2	921
Wood Data	80.8	7.8	4.1	3.3	0.6	1.1	2.3		

Table 3-5. Subject and date of publication of periodical items requested for loan (percent of total items in each subject)

Subject	Percent by date of publication					Total loan requests (000's)
	Prior to 1900	1900-1960	1961-1968	1969-1971	Unknown	
Humanities	6.4	49.3	27.7	15.3	1.3	137
Social Science	7.4	36.2	32.6	23.5	0.3	118
Science & Technology	2.5	30.6	35.3	31.3	0.3	511
Other	1.4	17.7	41.1	39.7	0.1	148
Total	3.5	32.1	34.7	29.3	0.4	914

Table 3-6. Form of periodical loans sent out by subject

Subject	Percent by form of material				Total loans sent out (000's)
	Original	Photocopy	Microfilm	Other	
Humanities	24.2	70.6	5.2	---	138
Social Science	22.0	75.3	2.7	---	119
Science & Technology	11.7	88.1	---	0.2	508
Other	12.7	85.3	1.7	0.3	149
Total	15.1	83.3	1.4	0.2	914
Wood Data	11.7	85.8	2.5		

Table 3-7. Outcome of requests for periodical loans by subject

Subject	Outcome		Total loan requests (000's)
	Percent filled	Percent not filled	
Humanities	80.1	19.9	137
Social Science	68.9	31.1	120
Science & Technology	80.0	20.0	517
Other	86.6	13.4	149
Total	79.6	20.4	923
Wood Data	84.2	15.8	

Table 3-8. Outcome of requests for periodical loans by language of material requested

Language of material requested	Outcome		Total loan requests (000's)
	Percent filled	Percent not filled	
English	81.2	18.8	784
German	82.3	17.7	47
French	77.5	22.5	42
Russian	39.4	60.6	13
Spanish	54.5	45.5	13
Italian	75.1	24.9	12
Other	67.0	33.0	16
Unidentified	20.0	80.0	2

Table 3-9. Reasons periodical requests not filled, by subject (percent of total requests in each subject)

Subject	Reason				Total requests not filled (000's)
	Noncirculating	In use	Not owned	Other	
Humanities	7.8	1.1	64.3	26.8	24
Social Science	24.7	1.5	50.3	23.5	37
Science & Technology	7.2	2.1	55.3	35.4	90
Other	6.7	1.2	22.2	69.9	16
Total	11.1	1.7	52.3	34.9	167
Wood Data	4.0	4.9	56.0	35.1	

In the 1971 Westat/ARL study, we obtained annual interlibrary loan statistics from the sample libraries for a five-year period. These annual statistics were for total interlibrary loans including monographs, periodicals, and other kinds of materials. If we make use of the fact that 48 percent of all interlibrary loan requests were for periodicals, the five-year historical data may be used to project future demand for periodicals.

Figures presented in Table 3-10 were extracted from the 1971 study. The table shows the estimated total number of interlibrary loan requests and the estimated number of requests for periodicals received through the interlibrary loan offices or departments of academic libraries in the U.S. The estimated numbers of periodical loan requests were computed as 48 percent

Table 3-10. Estimated magnitudes of interlibrary loan requests received by academic libraries (1971 estimates)

Year	Estimated Total Loan Requests	Estimated Loan Requests for Periodicals
Reported Data		
1965-66	1,039,000	499,000
1966-67	1,191,000	572,000
1967-68	1,488,000	714,000
1968-69	1,750,000	840,000
1969-70	2,122,000	1,019,000
Projected Data		
1970-71	2,217,000	1,064,000
1971-72	2,461,000	1,181,000
1972-73	2,691,000	1,292,000
1973-74	2,946,000	1,414,000
1974-75	3,202,000	1,537,000

of the total loan requests. We have seen earlier in Table 3-2 an estimate of 933,000 interlibrary loan requests for periodicals from a sample of actual request forms completed over a one-month period during the 1971 study. The figure of 1,019,000 developed in Table 3-10, should be a more reliable estimate of the annual total.

The projected data for total loan requests were developed by fitting a straight line to the five years of historical data. A linear fit was good for the past data. The straight line projection assumes the past experience is a good indication of the future. This method clearly does not attempt to take into account any proposed or expected changes in the ILL system or changes in other factors that probably influence the amount of interlibrary lending, e.g., number of graduate students enrolled in academic institutions, level of federal research funding, and level of library budgets.

As a check on our earlier (1971) estimates of future demand, we obtained similar data on the level of ILL activity for a sample of libraries in a survey at the outset of this study. The latter findings produced an estimate of 1,790,000 total requests received by academic libraries in 1971-72. From Table 3-10 the figure we projected for 1971-72 from the historical data was 2,461,000 loan requests. Furthermore, the estimate for 1971-72 of 1,790,000 loan requests is approximately equal to the 1968-69 level of lending. In order to verify this apparent reduction in interlibrary loans, we analyzed data from 26 large libraries (collections of 500,000 volumes and over) that reported data in both the survey conducted in 1971 and the current one, 1973. The volume of interlibrary lending for these libraries for 1971-72 had remained about at the same level as for the year 1969-70 as shown in Table 3-11.

Table 3-11. Comparison of estimated interlibrary loans for 26 large academic libraries

Type of Library	Reported ILL Requests	
	1969-70 (71 study)	1971-72 (73 study)
Private	104,000	70,000
Public	242,000	282,000
Total	346,000	352,000

Apparently, the large private academic libraries have taken steps to reduce their ILL burden as reflected in the one-third drop in number of items loaned in two years. With this finding, there appears reason to adjust the estimated future demand to account for this slowdown in annual growth of interlibrary loan traffic. A linear regression model was fitted to the six years of historical data with a gap for the 1970-71 period for which no data were available. The regression results along with the estimated number of periodical requests (48 percent of total requests) are shown in Table 3-12.

Table 3-12. Estimated magnitude of interlibrary loan requests received by academic institutions (1973 estimates)

Year	Estimated Total Loan Requests	Estimated Loan Requests for Periodicals
1972-73	2,238,000	1,074,000
1973-74	2,393,000	1,149,000
1974-75	2,549,000	1,224,000
1975-76	2,705,000	1,298,000
1976-77	2,860,000	1,373,000
1977-78	3,016,000	1,448,000
1978-79	3,172,000	1,523,000
1979-80	3,327,000	1,597,000

The prediction equation used to produce the estimated total loan requests in Table 3-12 is,

$$Y = -9,124,142.86 + 155,642.86\ X$$

where

Y = predicted total lending (items or volumes)

X = forecast year (last two digits, e.g., for 1972-73, X = 73)

The use of the prediction equation implies an annual growth of 155,643 loan requests. Again, the reader should keep in mind that the estimates in Table 3-12 were based on extrapolating past experience. The estimated future lending of periodicals can serve only as a starting point for predicting demand that might be placed on a national system; more will be given on the prediction of demand in Chapter 7.

3.4 Need for Improved ILL System

The sheer volume of interlibrary loan of periodical materials supplied by a relatively small number of large academic libraries is, perhaps, the best indicator of need for improvement in the present system. Almost 80 percent of the total loan requests for periodical literature go to the largest 100 or so academic libraries. These same large libraries in turn only borrow about half the amount they loan. From Table 3-12, the estimated number of periodicals requests in 1973-74 is about 1.1 million. This means that the large libraries could be supplying roughly 440,000 loans over the amount they borrow. Financially, they could incur net lending costs of about $2,200,000 assuming a cost of $5.00 per request. It is important to remember also that

the distribution of loan requests over the 100 or so large libraries is heavily skewed with a relatively small number of libraries doing the bulk of the lending.

In order to solicit attitudes and opinions on the present ILL system and their perceived needs, questionnaires were mailed to a sample of academic library directors and interlibrary loan librarians. (For details of this survey, see Appendix A.) Library directors of large libraries indicated that the primary burden experienced is the financial burden for lending materials, Table 3-13. In Table 3-14 we see that large private library directors perceive a greater financial burden than the directors of large public libraries. This concern on the part of large private libraries may have contributed to the large reduction in interlibrary loans received by these libraries as reported earlier in Table 3-11. Individual libraries have ways of reducing future loans requests by putting up barriers or not providing good service.

When asked directly about the adequacy of the current ILL operation in meeting user needs for materials not available in their own collections, 23 percent of the library directors stated that it was not adequate for periodicals, Table 3-15. For a more thorough discussion on the financial burden of large net lending libraries, the reader is referred to the concurrent Westat study[6] on financing interlibrary loans.

No individual library can collect all the worthwhile periodical materials for its users with the current tightening of library budgets, and it is going to be even more difficult in the

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[6] Palmour, Vernon E., Olson, Edwin E. and Roderer, Nancy K., Methods of Financing Interlibrary Loan Services, Washington, D.C.: Association of Research Libraries, February 1974.

Table 3-13. Directors: Type of ILL lending burden experienced by collection size of responding library

ILL Lending Burden	Collection Size, As Sampled (Volumes)				Total Respondents
	20,000-99,000	100,000-499,999	500,000 and over	All Libraries	
None	100%	93%	41%	57%	90
Yes	-	7%	58%	42%	66
Cost of lending	-	7%	55%	39%	62
Deterioration of materials	-	3%	23%	17%	26
Loss of local use	-	3%	23%	15%	24
Photocopying load	-	3%	28%	22%	35
Other	-	3%	7%	5%	8
Don't Know	-	-	-	-	0
No Answer	-	-	1%	1%	1
Total	100%	100%	100%	100%	157

Table 3-14. Directors: Type of ILL lending burden experienced by collection size of responding library and by public/ private status of library

	Collection Size, As Sampled (Volumes)					
	20,000-99,999		100,000-499,999		500,000 and over	
ILL Lending Burden	Public	Private	Public	Private	Public	Private
None	100%	100%	87%	100%	44%	37%
Yes	-	-	13%	-	54%	63%
Cost of lending	-	-	13%	-	49%	63%
Deterioration of materials	-	-	7%	-	21%	24%
Loss of local use	-	-	7%	-	23%	21%
Photocopying load	-	-	7%	-	33%	22%
Other	-	-	7%	-	7%	7%
Don't Know	-	-	-	-	-	-
No Answer	-	-	-	-	2%	-
Total	100%	100%	100%	100%	100%	100%

Table 3-15. Directors: Adequacy of current ILL operation in meeting user needs for material not available in own collection, by collection size of responding library

Adequacy of Current ILL	Collection Size, As Sampled (Volumes)				Total Respondents
	20,000-99,000	100,000-499,999	500,000 and over	All Libraries	
For monographs					120
adequate	81%	79%	76%	76%	
not adequate	13%	21%	23%	21%	33
For periodicals					114
adequate	75%	79%	73%	73%	
not adequate	13%	17%	25%	23%	36
For other materials					34
adequate	19%	27%	19%	22%	
not adequate	6%	14%	10%	10%	16

future for libraries to maintain adequate collections. Improvement in the ILL system should be made at the national level. With the present informal interlibrary loan system, library managers do not feel that they can depend on the system to supplement their own collections. There is a strong tendency for each library to strive to be completely self-sufficient; of course, this is no longer possible. Library managers require a national system that assures them of certain materials being available. This kind of access would provide the needed flexibility in allocating the constrained resources that an individual library has available.

Wood,[7] in effect, combined the serial collections of 325 U.S. libraries in the fields of chemistry and chemical engineering, and he found that collectively, they held complete sets for only 10,810 of the 16,361 serials considered important in those fields. The availability of the serials for each of the nine U.S. Office of Education regions was much lower with the average region containing complete sets of only about 5,000 titles. Illinois was the strongest single state with about 6,000 of 16,361 titles. Although these findings are based on a narrow subject field, Wood indicated the results should hold across the full range of science and technology.

3.5 Alternative Approaches for Improvement of the ILL System

Many alternatives could be conceived for improving the present interlibrary loan system ranging from minor changes to drastic alterations. Alternatives might be treated as short-term and long-term solutions. In this study, we are concerned with major long-term improvements for access to the periodical literature. Three primary alternatives often voiced in terms

[7] Wood, James L., Op. cit., Vol. II, p. II.32.

of being most realistic are reorganizing existing resources, developing state and regional networks, and creating a new national center.

3.5.1 Existing Resources

Some librarians feel that existing resources would be adequate if financial support was available to compensate the lending libraries. Stevens[8] recommended better organization of interlibrary loan on a national basis with a strong central planning and coordination, but with a highly decentralized service program. His recommendations include organizing regions with each region having a bibliographic center and designated regional resource centers.

The development of bibliographic centers that would provide better access to existing resources could offer significant improvement to interlibrary lending. On the other hand, it does not guarantee access since document delivery is sometimes the weakest link in identifying, locating, and securing a document.

Perhaps the greatest problem in using only existing resources is the lack of titles. As discussed earlier, Wood concluded that scientific and technical serials and conference proceedings volumes are not widely enough available to users in the United States. Planning, even at the national level, may not provide the impetus necessary to implement the concept of "shared resources" depending on voluntary participation by libraries. The concept is often discussed, but seldom accomplished in the

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[8] Stevens, Rolland E., A Feasibility Study of Centralized and Regionalized Interlibrary Loan Centers, Washington, D.C.: Association of Research Libraries, April 1973.

many existing consortia and cooperative ventures. A library manager needs to know with confidence that, if he chooses not to obtain a title, it will be available in the system. An informal or voluntary cooperative system does not insure this kind of availability over a long-term period.

3.5.2 State and Regional Networks

Several states have existing state networks or systems providing good lending services between public, academic, and special libraries, e.g., New York, Illinois, Minnesota, and Wisconsin. These networks and systems take on a variety of structures ranging from the New York network of a number of resource libraries to the Minnesota model with a single resource library serving as backup to the entire state.

At the regional level, multi-state, there are not many systems that have successfully linked the different kinds of libraries together for purposes of interlibrary loan. A few systems have accomodated libraries of a single type or in a given subject field, e.g., medical libraries and academic libraries. The Pacific Northwest Bibliographic Center (PNBC) is a cooperative switching center through which libraries of all types share their resources via interlibrary loan. Housed in the University of Washington Library, PNBC maintains a union catalog containing several million cards giving the holdings of about 40 libraries in the region. PNBC was incorporated in 1970 as a non-profit corporation by the state library agencies of Alaska, Idaho, Montana, Oregon, and Washington with provision for individual membership from British Columbia libraries. Although the number of loan requests received by PNBC is rather modest, 40,000 annually, the necessary regional structure and a service-oriented staff have resulted in the foundation for viable regional resource sharing between all types of libraries.

The above are but a few examples of development of interlibrary loan services within states and regions. Whatever is recommended for development at the national level must encourage the continued growth of such systems. One approach to a national periodical resources system, advocated by some librarians, is that of a number of regional centers linked together with a single national center as backup. This kind of system might be similar to the Regional Medical Library Program of the National Library of Medicine. Such a regional system could be built upon the existing collections of resource libraries that would be invited to serve as regional centers. Another approach to a regional scheme would link a number of newly-created periodical resources centers.

3.5.3 A Single National Center

The alternative improvement to the availability of the periodical literature perhaps most discussed over the years is that of a single national center to serve the entire nation. U.S. librarians familiar with the highly successful National Lending Library for Science and Technology in England have questioned the feasibility of a single national center. The pros and cons of a single center have long been discussed. Two primary questions, generally raised with regard to a single center are:

1. Could one location provide adequate delivery service that depended, in part, on the U.S. Postal Service?
2. Would demand reach such a high level that a single facility could not physically handle the loans?

4. TWO EXISTING NATIONAL MODELS: BRITISH LIBRARY LENDING DIVISION AND THE U.S. REGIONAL MEDICAL LIBRARY PROGRAM

Before considering alternative designs for a national plan to improve access to periodical resources, it is worthwhile to briefly describe two successful national lending systems currently in operation. The British Library Lending Division specifically that component formerly known as the National Lending Library for Science and Technology (NLL), provides the United Kingdom the service that a national system would be expected to offer in the United States. The NLL, with more than a decade of experience, is a working model of the concept investigated in this study.

The second national interlibrary lending system with a record of history is the U.S. Regional Medical Library Program (RMLP) of the National Library of Medicine (NLM). In contrast to the NLL single centralized center approach, the RMLP is a hierarchical network system including a number of designated resource libraries located in defined regions of the U.S. with the NLM serving as a single national backup library. These two operating models represent two of the alternative structures most often considered for a national periodical lending system in the U.S.

4.1 British Library Lending Division

The year 1973 saw the establishment of the British Library as the national library organization in Great Britain. Years of planning preceded this reorganization of the national

library components into a single structure.[1,2,3] Lending activities were combined with the merger of the National Central Library (NCL) and the National Lending Library for Science and Technology (NLL). In July 1973, the NCL stock, union catalogs, and key staff moved from London to Boston Spa (location of NLL) to form the Lending Division.

In planning for any kind of a national periodical resources system in the United States, it is paramount that the history and experience of the NLL be considered. Their highly successful operation outshadows all other library experience in acquiring, storage, and lending of serial publications at a national level. It is only possible in this report to present those aspects of the NLL that appear vital to the planning of a national system in this country. Volumes have been written on the NLL since its early planning in 1956 (with opening in 1962), including several historical reports and books.[4,5,6] Since one alternative design for the U.S. is essentially the NLL model of a single warehouse-type operation with a dedicated collection of all worthwhile periodical titles, their experience provides a rich source of planning data.

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1 Report of the National Libraries Committee. (Dainton Report), London: HMSO, 1969.

2 Great Britain, Paymaster General, The British Library. London: HMSO, 1971.

3 Department of Education and Science, The Scope for Automatic Data Processing in the British Library. Two Parts. London: HMSO, 1972.

4 Houghton, Bernard. Out of the Dinosaurs: The Evolution of the National Lending Library for Science and Technology, London: Clive Bingley Ltd., 1972.

5 Watson, Peter G. Great Britain's National Lending Library. Los Angeles: UCLA School of Library Service, 1970.

6 Department of Education and Science, Principal Documentary Evidence Submitted to the National Libraries Committee, Vol. 1, London: HMSO, 1969.

Before proceeding, it should be noted that reference is made throughout this text to the NLL. Actually, the NLL no longer exists as a separate entity and is part of the British Library Lending Division (BLL). The interest of this study is primarily on NLL as it existed prior to the merger, consequently the use of the label NLL. Specifically, their experience with serial publications rather than monographs is of major concern.

The basic planning data required for this study can be broadly categorized into collection, demand for services, facilities, staff, and cost. Data deemed pertinent in each of these categories are presented and discussed briefly in the following sections.

4.1.1 Collection

The original aim of the NLL was to meet the periodical literature needs of the practicing scientist and technologist. In recent years, the scope has been expanded to include social science and humanities. This coverage includes agriculture and medicine also. NLL defines periodicals in a broad sense to cover monographs in series (excluding commercial publishers series) as well as the usual periodical material. A liberal acquisition policy is directed at obtaining all "worthwhile" titles, irrespective of language. The guideline for deciding what is "worthwhile" is generally interpreted as periodical titles that are, or perhaps should be, covered by the guides to the literature, such as abstracting and indexing services and publications.

The main sources of periodical titles used by the NLL for selection purposes are national lists, subject lists, library holding lists, lists of journals scanned by abstracting journals, publishers' announcements and samples, donations, suggestions from

exchange contacts and requests from borrowers. The first three have been found to be least reliable and probably the majority of the orders that are subsequently cancelled are for titles obtained from these three types of lists. Now that the NLL collection has completed its building-up phase, the most useful source of titles considered for acquisition is the requests from borrowers for titles not owned.

The early policy on collection building was to make the library's serial holdings comprehensive from 1950, and then to acquire the older literature for which demand could be identified. Librarians were invited to deposit their little used serials at the NLL with the understanding that the material would be available for loan when needed. By 1963 about one-third of the 400,000 volumes in stock had been received through donations.

When NLL opened in August, 1962, 12,000 current serial titles were being received with another 10,000 titles on order. Table 4-1 shows the growth in the number of serial titles received by the NLL and indicates the number of titles on order that had not been received.

In addition, another 65,000 dead serial titles are housed at the NLL. About 250,000 monographs were also available in 1972 (excluding the NCL collection recently merged with NLL). The NLL has acquired the largest collection of report literature in Western Europe. Conference reports are systematically collected also.

One of the unusual characteristics of the NLL, as an operating library, has been their lack of the usual library records. The collection is shelved in alphabetical order which precludes the use of a shelf list to locate titles. A list of serial titles together with their shelf marks is produced from

Table 4-1. Current serial titles received by the NLL*

Year	Current Titles Received	Titles on Order Not Yet Received
1963	14,706	not reported
1964	20,783	4,790
1965	22,619	3,616
1966	26,289	3,829
1967	29,693	2,997
1968	31,904	2,834
1969	34,300	5,374
1970	35,824	4,607
1971	36,980	4,950
1972	40,192	4,484

* Sources of Table - 1963 data, Department of Education and Science, Principal Documentary Evidence, Submitted to the National Library Committee, Vol. 1, London: HMSO, 1969 (p A146) - data for 1964-1970 Urquhart, D. J., "NLL Progress 1970." NLL Review 1 (2), (p 44) - data for 1971-1972, Urquhart, D. J. "NLL Progress 1972." NLL Review 2 (6) (p 173).

Hollerith cards for staff use only. Urquhart, Director of the NLL, has expressed his views often against the development and use of a catalog. The existence of a catalog or even an updated list of titles would tend to prevent librarians from requesting titles not owned by NLL, thus depriving them of the most valuable selection tool.

Another unique characteristic of the NLL collection is the binding of separate issues, referred to as part-binding. Since the early days of their operation, the heavily used titles have been part-bound by a commercial binder. About 1,500 journal issues are currently sent out each week for part-binding which takes from one to two weeks.

4.1.2 Demand

Over 4,000 approved borrowers, made up of all types of libraries, use the services of the NLL. The number of requests received annually has grown substantially, as shown in Table 4-2. Figures presented in Table 4-2 include a small number of requests for monographs. In 1972 the number of requests for monographs was 118,000. About 88 percent of the total requests are filled.

Table 4-2. Number of requests received annually*

Year	Total Requests	Increase From Previous Year	Percent Increase
1963	233,600		
1964	312,700	79,100	33.8
1965	404,400	91,700	29.3
1966	521,600	117,200	29.0
1967	635,500	113,900	21.8
1968	779,000	143,500	22.6
1969	928,300	149,300	19.2
1970	1,080,400	152,100	16.4
1971	(1,222,300)**	(141,900)**	13.1
1972	1,411,500	(189,200)**	15.5

* Figures obtained from NLL Review articles cited in Table 4-1.

** Figures in brackets are estimates based on adding estimated "lost" requests due to prolonged postal strike in 1971 to the actual 1971 requests.

Perhaps one of the greatest changes in recent years at the NLL, as far as service, has been the rapid increase in the use of photocopy. A major factor which served as a deterrent in the past was a personnel limitation. With adequate personnel in recent years, the photocopy portion of the business has grown to 51 percent of the total issues dispatched in the U.K., based on a three-week sample of requests analyzed during July, 1973. Almost

all loans overseas are photocopies in addition to those in the U.K. The proportion of total serial issues that go out in the form of photocopy is expected to level off at about 60 percent. If the request form received does not specify, NLL retains the right to send a photocopy up to 20 pages. NLL has found that it is generally cheaper to fill a request of 20 or less pages by means of photocopy.

4.1.3 Facilities

The NLL recently occupied their new multi-story building designed specifically for their unique operation. Perhaps the materials handling requirements can be better appreciated if the flow of materials in a typical day is considered as follows:

Incoming - 6,000 requests
3,000 returned loan items
1,800 new stock items

Outgoing - 6,000 loans and photocopies

Special conveyors and shelving units were designed for the new building. Numerous innovations such as these were incorporated based on staff experience. The pre-1960 serials, which contributes only about 10 to 20 percent of the current total demand, are retained in the old building.

The cost of the building was about $3.75 million with all fixtures except furniture. Included are costs of $250,000 for mechanical handling equipment and $575,000 for shelving. It was estimated that the current price of the building would be more like $5 million.

Another building similar to the one just occupied is expected to be started in the near future. With the move of the NCL collection to Boston Spa and the expected growth in the combined operations, additional facilities will be required.

4.1.4 Staff

Prior to the move of NCL to Boston Spa, the NLL staff numbered about 314 with total annual salaries of about $1,500,000. The staff consisted of the following levels:

Senior management	- 6	
Professional grades	- 38	
Library assistants	- 118	
Clerical assistants	- 36	
Photoprinters	- 22	FTE
Machine operators	- 3	
Administrative support	- 23	
Industrial people	- 68	

It was estimated that approximately 85 percent of total operations and costs are attributed to serial titles with the remaining 15 percent associated with monographs (prior to NCL merger).

4.1.5 Costs

For the most part, the NLL is funded by the Department of Education and Science which finance the staff, purchase of literature, binding, communications and the translation program. Other governmental departments cover the costs of buildings, equipment, maintenance and supplies. The estimated total budget for the Department of Education and Science items for the year 1972-73 was about $3.6 million, assuming an exchange rate of $2.50 for one pound sterling. For the year 1971-72 the same

budget items were estimated at $3.3 million and were distributed over the accounts as follows:

Staff	$1,000,000
Literature	1,280,000
Binding	115,000
Translation Program	632,000
Communications	300,000
Total	$3,327,000

In the year 1971-72 the NLL had income of about $925,000 from the sale of loan/photocopy forms and translations. Costs for buildings, etc. are not available.

Each year the NLL spends more funds on literature and binding than on their staff. This is highly unusual for a library; in most libraries, staff costs are the greatest expense. Considering the cost of literature and binding per loan (or photocopy), the unit cost has decreased over the years of NLL's operation.

4.2 Regional Medical Library Program

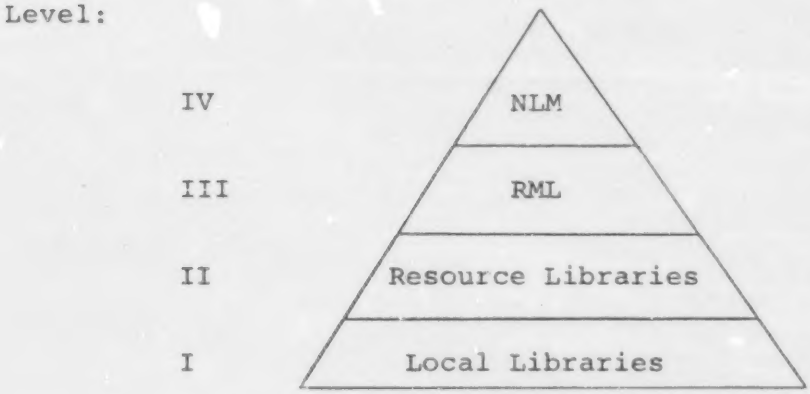
In the United States, the Regional Medical Library Program (RMLP), one aspect of the Biomedical Communications Network (BCN), provides another type of model for a document delivery system, based on utilization of existing resources rather than establishment of a dedicated lending resource.

This program is designed to provide general access to the medical library resources of the nation by extending the resources of large health sciences libraries beyond their prime constituency to a much wider regional community. Implementation is achieved by support through the National Library of Medicine (NLM) of existing institutions willing and able to assume the

required service responsibilities.[7] The NLM also serves as back-up resource to the regional libraries.

The system is hierarchical, including four levels of service as shown in Figure 4-1.

Figure 4-1. Medical information delivery hierarchy



Level No. I, the basic unit, is defined as essentially independent, free-standing educational organizations, including community hospitals, colleges and junior colleges with meaningful health science education and training programs, and other health-related schools (research organizations or government agencies). This level is expected to supply 70-80 percent of the needs of its user population.

Level No. II is composed of resource or participating libraries, principally in medical schools, chosen by the Regional Medical Library (RML) to provide first recourse to a particular group of local libraries; they are expected to meet about 90 percent of the requests referred to them.

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[7] "National Library of Medicine Regional Medical Library Program Policy Statement." Bulletin of the Medical Library Association 60 (2) April 1972.

The eleven Regional Medical Libraries at the third level include one special science and technology library, two medical academy libraries, and eight university medical school libraries. They are expected to fill approximately 85 percent of the requests unfilled by lower echelons, with the balance forwarded to the fourth level, the National Library of Medicine. Approximately three percent of the requests are referred by NLM on to the British Library Lending Division. The remainder of unfilled requests are returned to the requesting library as unfillable.

Currently (fiscal year 1973 data) the referral levels are supplying about 76 percent of the materials requests received, down from a high of 80 percent in 1969-70. By regions this ranged from a fill rate of 60 percent in one region to 84 percent filled in another region. As national backup (Level IV), the NLM filled approximately 72 percent of the requests received from the regions in fiscal 1973. The fill rate of requests received at NLM as a RML for one of the 11 regions was 73 percent during the same period. (NLM serves as the Regional Medical Library for Region 4.)

On the national level (Level IV), NLM also handles direct requests (two level service) from other countries, as well as from military medical facilities overseas. Recent establishment of an additional RML at Sao Paulo in Brazil, which now serves Brazil and Peru, provides a three level service which is eventually expected to include all of Latin America except Mexico.

4.2.1 Historical Development

Unlike developments in the British Library system, there has been relatively little published documentation on the medical information network.

Interlibrary lending of medical materials was provided by the then Library of the Army Surgeon General's Office as early as the 1880's. Serving as a national medical information resource from this period on, the Library was designated as the National Library of Medicine by act of Congress in 1956. Following early traditions, NLM continued to pioneer in the rapid dissemination of information. By 1965-66 the volume of lending by the Library in this two level system had reached approximately 150,000 items per year, and a third service level, the Regional Medical Library Program was developed to improve both general access and service.

The first grant for a Regional Medical Library went to the New England Region in 1967. Since that time, the number of national RML's has grown to eleven, with the last RML operational early in fiscal year 1971. By fiscal year 1973, the program was providing almost half a million loans to local libraries, with an additional 75,000 items supplied by NLM as the national back-up resource.[8] Approximately 90 percent of all materials supplied were photocopies of journal articles. The NLM has a journal collection of approximately 20,000 titles. Several hundred new titles are added each year.

Growth of demand on the total system rose rapidly as new regional facilities became established and publicized, with fiscal year 1973 showing a growth in demand over fiscal year 1970 of about 79 percent. During this period, the accelerating demand led to the addition of a new level of resource of participating libraries, principally other medical school libraries in the region, to provide for still more comprehensive localized supply of medical materials.

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[8] In addition to filling 73,462 requests on the national level in fiscal year 1973, NLM also filled an additional 45,928 requests as RML for Region 4.

Some recent flattening of demand has been noted (demand in fiscal year 1973 showed an increase of only 13 percent over requests in fiscal year 1972). With the introduction of MEDLINE (Medical Literature Analysis and Retrieval System On-line) in October 1972, however, local librarians are noting a new upswing in requests, as reported to MEDLINE training personnel. There are as yet no statistics to verify or refute such a new increase. It should be noted that Index Medicus and MEDLARS have provided a significant level of knowledgeable access for some time.

4.2.2 Operation of the Regional Medical Library Program (RMLP)

Immediate objectives of the RMLP[9] include the following:

1. Rapid and efficient delivery of documents.
2. Optimal cost-effectiveness.
3. Access to the nation's information resources.
4. National coordination.
5. Deal with that group of requests which cannot ordinarily be fulfilled by institutions of prime responsibility.
6. Take into consideration the broad variation in resources and users across the country.

Under the Medical Library Assistance Acts of 1967 and 1970, the NLM reimburses the Regional Medical Libraries (RML's) for filled loans at a negotiated rate ranging from $2.50 to $3.00 per filled loan. This fee is expected to cover full lending costs (including indirect costs). RML's in turn, subcontract with

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[9] "NLM...Policy Statement." Op. cit.

resource libraries for the provision of direct services to specified groups of local libraries. All unfilled requests are submitted, without verification, to the next higher echelon.

Existing collections of the libraries utilized in the network provide the resources for the program, together with the outstanding medical collection of the NLM. Table 4-3 shows the lending activity for the period 1970-1973.

Table 4-3. Lending activity for the Regional Medical Library Program

Fiscal Year	Total Requests	Requests Filled	Rate of Fill (Percent)	Rate of Demand Growth (Percent)
1970	380,054	302,623	80	
1971	525,771	416,252	79	38
1972	601,861	475,401	79	14.5
1973	678,944	517,394	76	13

Contracts and subcontracts within the system also provide for service levels in terms of delivery times. In general, about 80 percent of requests filled are filled in-house within three working days. In fiscal year 1973, calculated on a calendar day basis, regions reported from 75.3 percent to 98.7 percent of requests filled within four calendar days.

5. DESIGN ELEMENTS FOR A NATIONAL PERIODICAL RESOURCES SYSTEM

5.1 Why a National Periodical Resources System?

With rare and notable exceptions,[1] interlibrary loan in American libraries plays a role subordinated to the primary mission of provision of library materials and services to an identified local user group. Because of its secondary character, interlibrary loan has been a function sometimes last funded and first cut, and as a result, providing a service too frequently restricted, uncertain, slow and not cost effective. "Sharing of resources" and "rational and cooperative collection building" have seldom been realizable in this restrictive and undependable situation and many librarians have pursued the ever more unrealistic goal of self-sufficiency.

Despite the delays and inherent inefficiencies of the present ILL system, 75 percent of the library directors responding to our questionnaire (see Appendix A) considered that the present ILL system was adequate for current needs for monographs; and 73 percent considered it adequate for serials. Some exception may be taken to full acceptance of this finding on the grounds that users were not queried with regard to their degree of satisfaction with the level or adequacy of ILL services provided or offered; it has been well established that poor service induces low demand.

But even were that level of current service confirmed -- and the dedication of service-oriented ILL librarians has certainly overridden the basic weaknesses of the system in many

[1] Such as John Crerar, Linda Hall, Center for Research Libraries, MINITEX, WILS, ACM Periodical Bank and a few others.

cases -- trends in ILL create strong doubts as to the ability of this voluntary interchange to continue to satisfactorily meet the accelerating needs of interlibrary loan.

The expanding volume of materials produced -- the so-called "information explosion" -- combined with rising costs in materials and services and increasing budgetary stringencies, are widening collection gaps and make an accelerated sharing of resources virtually mandatory. Much of this increased demand will fall on the large research libraries, which are already supplying 75 percent of all materials requested of academic libraries.

For some time past the ratio of lending to borrowing of the large libraries (collection size of 500,000 or more volumes) has been increasing; in a recent five-year period, it grew from approximately two loans requested for each borrowing request to almost three loan requests per borrowing request.[2] And this gap can be expected to increase as all types of libraries attempt to remove barriers to access for the increasingly sophisticated information needs of a wide variety of users. Yet the heavy burden of costs for this unequal interchange, together with fears of diminished local response capability when materials are on loan or out for photocopying, has encouraged new barriers. Direct barriers through restrictions on users and materials supplied, and indirect barriers such as charges for services and delays in supplying materials, are emerging. Libraries are increasingly looking to national means for solving these problems.

We have seen in Chapter 3 from the analysis of ILL requests received by large academic libraries in 1969-70[3] that

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[2] Palmour, Vernon E., Bryant, Edward C., Caldwell, Nancy W., and Gray, Lucy M., A Study of the Characteristics, Costs, and Magnitude of Interlibrary Loans in Academic Libraries, Westport, Connecticut: Greenwood Publishing Company, 1972.

[3] Ibid.

requests for serials materials (principally journal articles) equalled slightly more than the combined total for all other materials requested from them during that period.

It is estimated that an initial collection of about 40,000 titles could meet virtually all requests for journal materials, excluding medicine, even those for generally rare and little used titles. Development of a nonrestrictive national periodical resources system could thus, with a relatively small collection (in comparison with collection sizes for monographs and other materials), supplant a substantial proportion of ILL demands on large research libraries while increasing access to these materials for all types of users.

5.2 Access to Periodical Materials

Accessibility to periodical literature in this country by those who need it is inadequate, and there is the likelihood that access will not improve, and may even worsen as time goes on.

From the Minutes of the 78th Meeting of
the Association of Research Libraries (1971)

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Three forms of access may be noted as necessary for full accessibility of periodical materials:

1. Physical access - The availability of needed material (or a surrogate, usually a photocopy but on occasion a microform) which can be delivered to the requester without delay, and in a format which can be utilized. This requires that the requested material must be either immediately deliverable from the designated collection or rapidly available from another identified

source, and that the form in which the material is supplied must be useful to the requester (e.g., a user without a microform reader would find microforms useless).

2. Knowledgeable access - Knowing what is available on a specific subject so that selection of needed materials can be made.

3. Intellectual access - Materials must be in a language and at a level of understanding relevant to the user.

The local library is generally the primary point of physical access for users in filling their information needs. The provision of physical access to additional supplementary resources thus extends the individual library's capacity for promptly and dependably meeting the demands of local users. It is this need for physical access which a national system should concentrate on in its initial effort.

Users, however, also require knowledgeable and intellectual access if their needs are to be fully satisfied, and programs to provide the requisite services should be considered as the funding and development of the system permit.

5.3 Goals of a National System

The primary goal of the total library community should be to provide the best possible access to information for all who need it. In working toward this overall goal, certain more specific and immediate goals and objectives may be identified as essential in developing a national plan for improved access to periodical resources. Two broad objectives of a system, that are

often not distinguished, are 1) extending the range of titles available in the U.S., and 2) supplying the interlibrary loan needs of the U.S. libraries. The second objective is of primary importance in this study. With this overall objective in mind, the following goals and specific objectives have been established.

Goal 1. Improved access to periodical materials for all users.

Objective A. To insure availability of all worthwhile periodical materials so as to meet the needs of all users for such materials not held by their primary resource library or not available in that library at the time of request.

Objective B. To increase the probability that libraries can initially direct their requests for needed materials to a source which holds the materials requested.

Goal 2. Improved delivery of periodical materials.

Objective A. To provide more dependable delivery of periodical materials than is currently possible through the ILL system.

Objective B. To achieve a lower average delivery time than is currently provided by ILL.

Goal 3. Reduced burden on large net lenders of periodical materials.

Objective A. To reduce the number of requests made to large resource libraries for periodical materials.

Objective B. To provide more equitable distribution of costs in provision of periodical materials.

Goal 4. More effective utilization of individual library funds in the provision of periodical materials.

Objective A. To provide libraries the opportunity to better balance acquisitions of new titles, number of current subscriptions, and number of duplicate subscriptions held.

Objective B. To permit reductions in binding and holding of retrospective materials.

More effective utilization of library funds is, of course, a matter solely controlled by the libraries. Establishment of a periodical resources system with a dedicated collection of journals, available to all users without restriction, could change the current patterns of access by favor (interlibrary lending) to access by right (to a specifically developed and appropriately funded resource system).

This replacement of access by favor with access by right should not only provide a suitable climate for rational assessment of acquisitions and retention policies, but should also meet the specific objectives of reducing the ILL demand on the large research libraries.

The degree to which all goals are met is dependent upon the scope and dependability of service provided. These factors, therefore, determine the primary thrust of design for a national system.

5.4 Summary of Initial Design Features for a National System

In this section, the recommended initial design features for a national periodical resources system are summarized. The rationales for choosing these suggested features are discussed in more detail in the remaining sections of this chapter.

Suggested initial design features for a national periodical resources system include:

1. The collection of the system should be comprehensive in subject coverage, excluding only the biomedical areas covered exhaustively by the National Library of Medicine.

2. All worthwhile journals should be collected.

3. Value of content rather than language should be the criteria for selection.

4. Both heavily used and little used materials should be made available.

5. Potentially, the system should have full coverage of both current and retrospective materials, including some deceased titles. Initially, the collection should begin from a specified collection date, as far in advance of opening as is possible. Retrospective materials could be made available by gradual addition to the collection or by utilization of one or more existing collections as a coordinated retrospective resource.

6. Service should be made available to all users without any restriction other than access through a library. Possibility of direct access by user should be considered for future adoption.

7. Initially, this service would be confined to rapid, dependable delivery of photocopies of journal articles and loans. Design goals for the system aim at one-day turnaround in-house for the bulk of requests, and delivery to the requester (with currently available delivery systems) within a maximum of 4-5 days from the date the request is received by the system.

8. Additional services should be phased-in as the capacity of the developing system and demand, make them feasible. Emphasis should be placed on early development of a referral capability for periodical materials not held in the system.

9. A computerized file of journal titles held, keyed to International Standard Serials Numbers (ISSN) will provide shelf location access to titles and issues held at the Center. Later incorporation of titles not held, with lending locations, could make possible implementation of the referral program noted above.

10. All feasible forms of communication and delivery will be utilized to provide the fastest possible satisfaction of periodical requests. Improvements in communications and delivery systems will be continuously reviewed and implemented as feasible. The system will be innovative in its attempts to improve both fill rates and delivery times.

11. All system operations will incorporate monitoring programs aimed at continuous evaluation of collection and services in terms of relevance to user needs and technological capabilities.

5.5 Scope of the Collection

Scope of the collection developed by a national periodical resources system will determine the specificity or comprehensiveness of periodical materials information needs to be met by that system. In establishing this scope, five specific elements must be considered:

1. Subject areas of the collection
2. Types of materials to be included
3. Language of publication
4. Frequency of use
5. Publication dates of materials.

5.5.1 Subject Areas of the Collection

Possible alternatives include:

Science and technology only
Social sciences only
Social sciences and humanities
All subject areas
All subject areas except medicine

Demand for periodical materials on academic libraries in 1970-71, according to the Westat data,[4] is shown by subject area in Table 5-1.

Table 5-1. ILL periodicals requests and fill rates in 1970-71 by subject area

Subject Area	Percent of Total	Percent Filled
Humanities	15	80
Social Science	13	69
Science and Technology	56	80
Other*	16	87

* Other includes subjects such as library science and business, as well as multi-disciplinary general topics.

Periodicals in the area of science and technology show a demand greater than for all other subject areas combined. The rate of fill, however, is exceeded only by that in the miscellaneous category. Social sciences, although showing the least demand, also shows a rate of unfilled requests more than 50 percent greater than for any other subject area. This may be

[4] Palmour, et. al., Op. cit.

attributed at least in part to the substantially greater proportion of requests for these materials which are not filled because the periodicals are noncirculating (see Table 3-9, Chapter 3).

In viewing the data on subject demand in Table 5-1, several factors must be taken into consideration. Emphasis during the past decades has been heavily turned toward science and technological development. To meet the needs of scientists, indexing and abstracting services have been developed to provide at least limited knowledgeable access to the timely information covering developments in these areas. It can be assumed that such improvements in access spark similar increases in demand.

The current expanding emphasis on the "quality of life" is already producing some shifts in national interests from purely technological development. This increasingly inter-disciplinary approach to problem-solving makes for a substantial overlap in materials required for any specific discipline. Furthermore, some of the requests for periodical articles in a particular subject field may be found in multi-subject coverage periodicals or in periodicals not essentially identified with the subject field. It may be of interest to point out that although the NLL began its collection in 1956 with primarily those serials identified with science and technology, it has over the years found an increasing demand for social sciences materials which have gradually been added to the collection. A recent finding there showed that the addition of 4-5,000 more titles than they already have in humanities could permit total subject access in periodical materials, a project which is currently underway.

Provision of physical access to periodical materials in all subject areas, however, does not necessarily assume that all of these materials must be included in a new system's collection.

The National Library of Medicine, as the world's largest research library in a single scientific and professional field, collects materials exhaustively in the biomedical areas. Duplication of this total coverage would prove an expensive and unnecessary redundancy. Although some duplication of holdings is inevitable in related subjects such as chemistry, physics, zoology, etc., where general demand, as against medical demand, must be anticipated, the system would not be expected to collect in the biomedical areas. Joint channels of access and referral between the NLM and a national periodical resources system, however, should be established as an integral part of the operations.

Agricultural materials held by the National Agricultural Library (NAL) on the other hand, fall heavily into overlapping subject areas, with demands from a wide variety of users, not all of them susceptible to satisfaction from the NAL or its network. No specific exclusions in collection of these areas are recommended, although channels of communication and cooperation for referrals of some requests should be established with NAL. Location and holdings information for titles in the NAL journal collection should be included in the system's referral file when developed.

5.5.2 Types of Materials to be Included

Possible types of materials include:

- Professional journals
- Lay-oriented subject journals
- General journals
- Conference reports
- Newspapers
- Newsletters
- Subject indexes and abstracts (periodicals)

A review of interlibrary loan activity logically suggests that the types of materials included in a national collection should be those showing the greatest demand in interlibrary loan. It may be noted that subject newsletters, indexes, and abstracts, which provide knowledgeable access to journal articles are more likely to generate demand for physical access to other materials than to be in heavy demand themselves.

The volume of newspaper titles, current and retrospective, is very large and some states and local public libraries perform archival roles in regard to their collection. Only a few large newspapers provide knowledgeable access to individual newspaper articles, and these newspapers are widely held. The sporadic use patterns of the bulk of newspapers borrowed through ILL channels make the present logical forwarding of requests to libraries in the region of publication reasonably satisfactory, and it is suggested that this is the channel in which they should remain.

Journals -- professional, lay-oriented, subject, and general -- are all in heavy ILL demand and provide a logical base for collection development. It is recommended, therefore, that the initial focus of the system's collection should be on worthwhile journals. Continued monitoring of ILL demands should expand the collection as required.

5.5.3 Language of Publication

Possible alternatives are:

English only
Selected foreign language
English and selected foreign languages
All languages

Of all periodical requests to academic libraries in 1970-71, 84 percent were for English language publications (Table 3-4, Chapter 3). This varied somewhat by subject area, with humanities showing the highest proportion of requests for foreign language publications (29 percent) and also the highest rate of filled requests in foreign languages (82 percent). Only 10 percent of the requests for social sciences journals were for foreign language publications, and only 40 percent of these requests were filled. While it could be postulated that low fill rates result in lower demand, it may equally well be assumed that users in the disciplines of humanities may possess greater foreign language capabilities.

As may be noted, the fill rate for both English and foreign language publications is lowest in the social sciences (Table 5-2). This may partly be attributed to the much higher percentage of periodicals not circulating in this subject area (Table 3-9, Chapter 3). Only in the humanities does the fill rate for foreign language periodicals exceed that for English language periodicals. Overall, about four-fifths of English language journal requests are filled, but only two-thirds of foreign language journal requests.

Despite the disparity in demand between English and foreign language materials, 95 percent of all library directors responding to our survey (see Appendix A) indicated that they

Table 5-2. Periodical requests by subject area and language

Subject Area	Percent of Requests Filled	Language of Publication	Percent of Total Subject Requests*	Percent of Requests Filled
Humanities	80	English	70	79
		Foreign	29	82
Social Science	69	English	88	73
		Foreign	10	40
Science and Technology	80	English	84	82
		Foreign	16	71
Other	87	English	94	87
		Foreign	6	77
All	80	English	84	81
		Foreign	16	68

* Does not always total 100 percent since language was not always given.

wanted both English and foreign language titles held at a proposed periodicals center. As may be noted in Table 5-3, there was relatively little difference in desire for holdings in Western European and other foreign languages. Although humanities showed a substantially higher rate of requests for foreign language materials than were reported for social science and science and technology periodicals, there is surprisingly little difference in the perceived subject needs for foreign language materials shown in Table 5-3.

An acquisition policy based on content rather than language should be established. All worthwhile journals should be obtained irrespective of language. The NLL has found such an approach to be favorable.

Table 5-3. Desired holdings in a proposed periodicals center by subject, language, and usage

Subject Area	Percent of ILL Librarians Desiring Language to be Held		
	English	Western European Languages	Other Foreign Languages
Humanities			
Commonly used materials	80	75	65
Little used materials	81	73	66
Social Sciences			
Commonly used materials	82	74	64
Little used materials	84	74	64
Science and Technology			
Commonly used materials	82	75	69
Little used materials	82	74	70

5.5.4 Frequency of Use

Possible alternatives are:

Heavily used materials
Little used materials
Both heavily and little used materials

The high incidence of "not owned" as the reason for not filling requests (Table 3-9, Chapter 3) suggests the importance of a central source for materials whose level of use at an individual institution does not warrant their inclusion in the local collection. The almost equally high incidences of materials not available because they do not circulate, are in use, or are lost, missing or in-bindery, as well as the volume of periodical requests for replacement of pages or issues missing, damaged or destroyed in use, however, also suggests a need for more commonly

used materials which are already held in individual libraries. Experience at the NLL and the ACM Periodical Bank shows the titles requested most are titles used most in libraries.

A national periodicals system would best meet its goals of improved availability of materials, as well as of decreasing costs and burdens to individual libraries, by supplying both heavily and little used materials.

5.5.5 Publication Dates of Materials

Possible alternatives include:

Current materials only (most recent 12 months)
Retrospective materials only
Current and retrospective materials

While most library directors responding to our opinion survey (Appendix A) noted that they should be able to supply their own needs for current English language periodical materials, the majority also noted the need for a substantial collection of retrospective issues, both English and foreign language, for current and deceased titles. In many cases, however, it is the high demand current materials which are most often in use, noncirculating, or mislaid. Rapid access to these materials through a periodicals center offers the possibility of not only broader availability of these materials to libraries which do not own them, but of improved availability in-house for those libraries which do.

Difficulties in providing access to many retrospective materials in individual libraries include:

1. Volume of storage space required to store original issues.
2. Cost of microfilming back issues to reduce storage and improve retention.
3. Cost and difficulty of procuring back issues missing in collection.
4. Cost of binding originals retained.
5. Limited use in individual libraries of some retrospective materials, which does not warrant retention of them in the individual institution.

Obviously the provision of retrospective materials for an unlimited period could do much both to increase the availability of such materials to all library patrons and to impact individual library retention policies and costs. Initially the national system should develop its collection from a starting year onwards with retrospective materials considered for purchase in the future. Retrospective acquisition of those titles that are currently heavily used should be an important addition towards meeting demand. Donations from libraries could be considered as a means for obtaining retrospective materials. An alternative arrangement for acquiring back issues of current titles and deceased titles could be an arrangement with an organization like the United States Book Exchange, Inc. (USBE) to acquire these materials for the system. This might be in the form of a contract with USBE to locate and purchase specified titles desired.

5.6 Forms for Provision of Materials

Possible alternatives considered were:

Lend original copies of periodicals
Lend microform copies of periodicals
Supply photocopies of periodical articles
Supply microform copies of periodical issues
Supply tear sheets from original issues
Supply reprints of periodical articles

Although the term interlibrary loan of periodical materials presupposes that a periodical item is borrowed and returned, recent patterns of ILL lending in the U.S. show that in fact relatively few periodical materials are loaned. Most journal needs which cannot be supplied by the local library are met by photocopies of articles supplied by the lending library.

Historically this pattern of supply has evolved from a number of factors:

1. Users seldom need the entire periodical issue, usually just an article in it.
2. Loaning of an annual bound volume denies access to other users to a substantial mass of information for which the requester has no need.
3. Many requests for periodical materials are for recent issues which still have relatively heavy use within the lending library.
4. Many periodicals are noncirculating.

Provision of materials from a resource center which has no on-site user group eliminates some of these factors; there are no preferential demands or noncirculating materials, and materials can be kept unbound or bound in issues only.

Lending patterns of academic libraries in 1970-71 showed that about 15 percent of all requests for periodical materials were filled by loan of the original issue, while 83 percent were filled by delivery of a photocopy (Table 3-5, Chapter 3). Although no statistics are available, it has been suggested that in many of the cases where the journal issue is supplied in the original, photocopying of the article or pertinent material is undertaken either by the user or the borrowing library. We recognize then, in the use of periodical materials, a distinctly different pattern from that for other types of library materials.

Fifty percent of the library directors surveyed (Appendix A) preferred photocopies of articles and microform copies of issues to be supplied by a periodical resources center, while 62 percent of ILL librarians expressed a preference for provision of periodical materials in the form of photocopies. Objections to photocopies did not seem to stem from their form but were based rather on the cost factors associated with their supply. Few librarians would prefer general provision of originals rather than photocopies if there were no charges attached to the provision of the photocopies.

Several other advantages also accrue to the provision of photocopies instead of originals. Supply of photocopies is more essentially a "mail order" or merchandising, rather than a lending, operation. Since materials are not returned for reuse by another user, neither the delays of return, nor possible waits by reusers need to be considered. A single copy, or in some cases a few copies, at a center can meet, without undue delay, the needs of a large number of users. There are no problems also of materials lost through nonreturn, or damaged by use or misuse. Furthermore, since no control of materials by the borrowing library is required, delivery times, as well as library handling costs, may

be further decreased by the forwarding of such photocopies directly to the user whenever possible. And finally, supply of surrogates rather than original materials permits better use of the present and future technologies which will permit rapid dependable service and minimum unit cost.

Both Maurice B. Line and D. J. Urquhart of the British Library Lending Division have emphasized the difficulty of estimating initial demand for periodical materials at a national lending facility. Certainly the possibilities of estimating demands for a single article are nonexistent and delivery of tear sheets or reprints of articles would not appear to be feasible.

It is recommended, therefore, that the national system concentrate on the provision of materials in the form of photocopies except in the cases where only the original material would satisfy the user.

5.7 Copyright

As indicated above, the major service in the initial development phases calls for the provision of photocopies of journal articles. Current copyright laws require that property rights of individuals and organizations be respected in providing access to information. A recent decision in the case of the Williams and Wilkins Company vs. the United States has favored the doctrine of fair use with regard to the National Library of Medicine photocopying articles from medical journals. The Court determined that the NLM had not infringed copyright by their use of photocopy service.

5.8 User Policies

There has long been a fear on the part of some librarians that opening the flow of information to users without restrictions would create a flood of demand that would so inundate large libraries as to prevent fulfillment of their primary mission of supply of materials and services to designated user groups. Present interlibrary lending restrictions have been predicated on that concern as well as on costs and other burdens of a heavy ILL lending activity.

Experiences in those state systems which have opened the gates and are supplying interlibrary loan services to all types of libraries for all users have demonstrated the fallacy of such fears. True, demand grows as the possibilities of filling hitherto unmet needs are realized, but expansion is gradual and certainly within the competence of a well developed system.

Development of a national periodicals plan, then, should be focused on the supply of all necessary materials to all users. The need for librarian intervention to negotiate the system and to assure the best possible chance of locating the most relevant materials, indicates the requirement that requests should be forwarded through a library. Other reasons to require access through a library, at least initially, are (1) the requested material may be in the local library, (2) verification, and (3) free service to individuals could lead to misuse (NLM's experience). But even with these precautions, direct access by users should be considered as a future possibility. When feasible, photocopies could also be forwarded directly to the user rather than through the requesting library.

5.9 Proposed Services

The range of needed services which could be provided by a properly designed periodical resources system is broad. Possibilities for services include the following:

Regular service
Priority service
Special services
Archival service

5.9.1 Regular Service

Regular service is defined to mean prompt supply of the requested periodical materials. Absolute time schedules for deliveries cannot be calculated, since local delays and methods of forwarding requests as well as the vagaries of the postal system (which may be expected, at least initially, to handle the bulk of delivery of materials) are all factors over which the system would lack absolute control.

One day turnaround on all normal requests, however, should be realizable, and a goal of average delivery time within four days of receipt of request should be attainable for the most part.

A discussion of possible methods for transmitting requests and delivering materials will be found in Section 5.10.

5.9.2 Priority Service, Special Handling, Telefacsimile

Library systems which have tested the possibilities of telefacsimile as a rapid delivery agent have frequently noted

the low demand for such services. While some "rush" requests may be anticipated, scheduled one day turnaround would probably make special handling primarily a matter of choosing the fastest delivery service available. Regular service at the hoped for level should meet most of the needs of libraries for periodical materials. Development of any priority services might best be designed only to meet well-defined and demonstrated needs.

5.9.3 Special Services

Special services include:

Bibliographic services
Translations

It is recommended that initial development of the periodicals center should be confined to developing a rapid service for physical delivery of periodical materials, with special services phased-in as needs are defined. First priority in additional services should go to the referral capability, which could be implemented as bibliographic and holdings data for titles not held by the system become available. Provision by libraries of titles and holdings information for inclusion within a file should carry with it acceptance by these libraries of the national service standards. Referrals should be made by teletype, telefacsimile, or telephone to minimize delays in delivery of the requested materials to the user. A system which accepted all requests, whether or not the material was held, forwarding those it could not fill to the appropriate location, would not only greatly improve overall speed and access to materials, but would also provide a constant monitor on collection needs.

Other special services such as translations would only be considered as needs arise. Certainly, the services of the national program should not duplicate similar services already offered by the information industry. In some cases, e.g., translations, the system might serve as a coordinator of existing activities. The main role of the system requires a knowledge of the existing services as they may be useful in the promotion of better use of the periodical literature.

Configurations of a national system that rely on existing collections would need to consider the future development of a bibliographic file (perhaps, on-line) for location of materials.

5.9.4 The Center as an Archive

Development of a periodical resources center as an archive for periodical materials should not alter the service capabilities of the system, except perhaps to improve the overall capability for the provision of retrospective materials. Such development would, however, strongly impact the collection and retention policies of the system.

5.10 Communications and Delivery

While 24 hour turnaround within a single national center may be expected to be realizable for at least 90 percent of requests for journal materials, receipt of the request and delivery of the material requested is subject to a number of delays which are not under the control of the system. Choice of options is thus important to the overall delivery of service.

5.10.1 Access

Possible methods include:

Mail
Telephone
TWX
Computer (time sharing)
Telefacsimile

Studies of elapsed time rates in completion of ILL transactions indicate that a substantial loss of time is due to the mail service (mail handling within the requesting institution and the U.S. mail system) in transmitting requests for materials. For this reason, teletype access which can provide fast notification of needs is most desirable, and increased use of existing teletype facilities should be promoted. Since all libraries do not have teletype capability and since teletype costs are higher than mail costs, alternative methods of communication must also be established. First Class mail service appears to offer the best current alternative. More discussion on the U.S. mail service is given in the next section.

Telephone systems have not been widely used for interlibrary loan because of communications costs as well as problems resulting from garbled messages. Some libraries have begun urging greater use of telephones to minimize at least part of the mail delays involved in ILL transactions. However, Alfred J. Maupin, Chief of Library Services at the California State Library, notes that librarians who have been urged to utilize the state leased line telephone network to expedite requests for loans have remained reluctant to do so. Nevertheless, telephone provides a practical alternative to teletype, and it is suggested that a recording service operation based on a prepared form should be considered.

As indicated in the introduction to this study, a concurrent investigation was underway by Recker and Hayes, Inc., to consider the feasibility of a computer-based System for Interlibrary Communication (SILC).[5] The aim of SILC would be to facilitate the communication of interlibrary loan requests and messages, monitor the traffic in order to produce statistical reports and provide centralized clearinghouse accounting for fees, provide means for referral of requests to bibliographic centers, and provide access to on-line data bases. Participating libraries would use an existing national time-sharing system. If SILC is developed, it would provide fast access to a national system.

Maurice B. Line has indicated that the British Library Lending Division is considering the possibility of using telefacsimile for transmitting requests to backup libraries. This possibility for transmitting certain requests could have several advantages. The center would receive the full details of the request, as submitted, at the same speed as with teletype. Telefacsimile could be particularly important in the case of foreign language titles requested where the information can be easily garbled when keying for teletype.

In the earlier phases of development, mail must be expected to provide the medium of communication for a substantial part of the requests received. For those libraries with teletype equipment, teletype would be encouraged.

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[5] Hayes, Robert M., Final Report on a Study of a System for Interlibrary Communication (SILC), Washington, D.C.: Association of Research Libraries, February 1974.

5.10.2 Delivery

Possible methods are:

Regular mail
Air mail
Special service mail
Private delivery system (UPS)
Telefacsimile
Courier

At present, most ILL materials are forwarded by mail, although a substantial volume of local exchanges are delivered by courier, where such systems exist.

The high cost and generally poor quality of telefacsimile would appear to make this method of delivery feasible only for "urgent" requests for materials. Where such systems have been installed, however, use rates have been extremely low, resulting in some instances in removal of the equipment after the testing period. Until proven means of electronic transmission of requested materials are available, a national system must rely on delivery of the physical document or a copy of the pertinent material.

Relatively rapid delivery of some materials is possible with such private delivery systems as the United Parcel Service, (UPS), but while UPS is competitive with the U.S. Postal Service in the nearby delivery of packages, it cannot handle First Class mail. Letter and manila envelopes are not handled, and the minimum acceptable envelope type packaging is described as an insulated mailing bag, although UPS has suggested that for flat, two ounce packages (estimated average weight of a photocopy), the use of brown envelopes with a cardboard reinforcing sheet might be permitted.

Delivery time for UPS is estimated as one day for locations within 150 miles and two days for destination within 400 miles. The minimum charge is 55 cents for an item weighing one pound or less, which makes this method of delivery for photocopies too expensive, and without providing substantial time savings in delivery.

The U.S. Postal Service mail delivery standards for ZIP-Coded mail provided for a maximum delivery period of two days for Air Mail and three days for First Class mail, within the continental states (Table 5-4).

Table 5-4. U.S. Postal Service mail delivery standards -- ZIP-Coded mail

Class	Overnight	2nd Day	3rd Day
Air	To designated cities (under specified conditions)	Nationwide (Continental states)	
First	Specified local areas (mailed by 5:00 p.m.)	Approximately 600 miles	Nationwide (Continental states)

Although service dependability does not meet desired standards, the U.S. Postal Service appears to provide the only currently feasible method for delivery of the large bulk of materials requested. Service possibilities should be optimized: presorting by ZIP Code at facility, delivery of mail to air or rail terminals in accordance with local schedules, perhaps even dispatch of mail pouches to designated libraries in courier networks for courier delivery in some cases, should be explored.

By means of such special services, it is hoped that delivery delays would be minimized and the projected service levels made possible. Certainly all materials should be forwarded by First Class mail with Air Mail utilized where urgency or distance make it necessary. The emphasis should be on delivery, whenever possible, directly to the user.

6. POSSIBLE CONFIGURATIONS OF A NATIONAL PERIODICAL RESOURCES SYSTEM

6.1 Structuring the System

"At its simplest, a national library could consist of two units, a lending unit and a reference unit..." notes Maurice B. Line of the British Library Lending Division.[1] "With appropriate duplication, the lending unit could satisfy such a high percentage of demand that there would be no place for interlibrary cooperation nor for union catalogs.... At its simplest, (it) would consist of only one unit, which would serve both reference and lending functions.... (But) the two functions are already firmly divided in Great Britain."

"...a system like this is probably nearer attainment in Great Britain than almost anywhere else, partly because of the relative smallness of most other libraries in the country, partly because...the compactness of the country, with good mail services and travel facilities, make it unnecessary to have more than one such large collection, certainly for lending purposes...."

But he also notes "I am sure that some of the solutions which may be applicable to Great Britain are quite inappropriate to a much larger country such as the United States, where sheer geographical distance may make large centralized collections undesirable--it is possible that you need four or five national lending libraries rather than one. During my month's visit to the United States last year, while I learned a great deal about

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[1] Line, Maurice B., "The Developing National Library Network in Great Britain," Library Resources & Technical Services 16:1: 61-73 (Winter 1972).

the operation of large library systems and the application of computers to them, I was struck again and again by the differences between the two countries--differences which are so fundamental that the solutions to national library problems cannot be the same."[2]

Apparently, Line does not view the lending operation in Great Britain, with its supply of all types of materials from a single centralized resource, as a model for development of a national library in the United States. We must understand that Line is speaking about a single resource center providing monographs, periodicals, and report literature. His point is well taken in that the centralized provision for monographs would not seem suited to the U.S. An important question is whether, in fact, a single resource center could provide adequate service for the provision of periodical materials. D. J. Urquhart, Director of the British Library Lending Division, who has similarly noted the differences between the U.S. and Great Britain, has questioned a replication of the NLL system in the U.S.

In discussing design elements in Chapter 5, some of these differences have been noted: the need for development of new methods of delivery because of the greater geographical size of the United States, the greater volume of potential demand for materials not held locally because of the larger population, and the differences in historical solutions to meeting such needs. To these we might add the vastly greater wealth of resources already available in the large federal, public, and academic libraries in the United States as well as recent advances in the use of automation for control of these resources. Obviously our solutions must reflect these differences.

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[2] Ibid.

We have already recognized the necessity for multiplication of "national libraries" in the United States by focusing on a national resource for periodical materials alone. We further accept divisions in providing this single type of resource. The National Library of Medicine supplies all types of materials in a clearly delineated biomedical subject area to a discrete user group. Truly a national topical center, it is not desirable to duplicate its periodical resources or attempt to subordinate a part of its service to a new entity.

The rich resources available in strong collections around the United States also make total duplication of materials in a single center both questionable and, perhaps, not cost effective. As we diverge from the concept of a single source, however, adequate location tools become a critical consideration. A national system should provide easy means of access combining lending and reference (library to library) functions and providing a focus for coordination of an important part of total information resources.

Based on the experience of existing national models, the goals and criteria established in Chapter 5, and the needs perceived by librarians, three basic configurations emerge for detailed investigation.

Configuration 1 - A single new facility providing access to all worthwhile periodical materials from a specified date forward. This approach is patterned after the NLL model. It is a two-level system in which all libraries requiring assistance are the basic level and the new facility is the upper level. This alternative will be referred to as the National Periodical Resources Center (NPRC).

Configuration 2 - A new multi-location national system based on a number of satellite resource centers with dedicated collections for supply of

heavily used periodical titles with a single national backup resource center collecting all worthwhile periodical materials. It is a three-level system with borrowing libraries as the basic units, satellite resource centers at the middle level, and a national resource center at the upper level. The national center is essentially Configuration 1. For discussion purposes Configuration 2 will be referred to as the Satellite System.

Configuration 3 - A regional resource network based only on designated existing library collections. This again is a three-level system with borrowing libraries as the basic units, the designated regional resource centers at the middle level and a national backup based also on existing collections at the upper level. Configuration 3 will be called the Regional Resource Network.

Configurations 1 and 2 are similar in that a new single comprehensive national center would be established to acquire, store, and make available all worthwhile periodical materials. The second configuration is an expansion of the first through the extension of satellite centers. Early development would be identical for the two plans. Configuration 3 is a plan to build upon already existing library resources. Backup to the designated regional libraries would be developed from existing strong collections such as the Center for Research Libraries, Library of Congress or other collections that could be considered as national in scope. A later option could be the gradual development of a dedicated national center, although for purposes of this study such an option will not be treated in detail.

Variations within each configuration also exist, particularly with regard to possible methods available for storage and retrieval of materials. In the remaining sections of this chapter, operational details will be discussed and consideration given to variations. The purpose is to specify the configurations

to the degree necessary for estimating their costs, presented in the next chapter.

6.2 Configuration 1 - A National Periodical Resources Center

Development of a totally new facility which will collect and supply all worthwhile journals from a given date provides the most simplistic approach to the design of a national periodical resources system. Since such a facility has no other previously established mission or clientele, it can be responsive to the need for development of a unique mission, and is not hampered by existing systems or methodologies.

Current patterns of lending show that most ILL requests for journal materials are filled by photocopies of articles and relatively few by loan of original issues. Restricting operations of the Center to a "mail order" or merchandising role utilizing a dedicated journal collection should provide the fastest possible service and the highest possible rate of fill with the direct one-step access considered most ideal.

Mail delays in receipt of requests and delivery of materials have suggested certain advantages of a multi-location system (Configuration 2). Since delivery time from a single location as against multiple regional locations makes a difference of only about one day, this is not considered a major factor in development of a single location facility. General and increasing lack of dependability in mail service, however, makes utilization of available communication alternatives and constant search for new delivery alternatives essential.

6.2.1 Developing the Collection

It is expected that the collection of the new Center would begin in 1976 with subscriptions to 10,000 of the most heavily used titles. An additional 10,000 titles, plus a one-year back file of these titles, would be added in 1977. By 1981 the period of phase-in is expected to be completed, and a basic collection of about 47,000 titles with retrospective files for five years established. Other new titles would continue to be added as they appear on the market with collection growth expected to average about four percent per year after 1981.

This study projects an opening date for a single facility NPRC in 1977 with a collection of 10,000 current titles with back files of one full year. Should a later opening date be selected, it is recommended that the proposed collection schedule should be maintained to ensure early development of the breadth and depth necessary to meet the bulk of periodical needs.

Incorporation of the periodical collection of the Center for Research Libraries (CRL) would accelerate development of the proposed comprehensive center collection. As of January 1974 the CRL had about 30,000 periodical titles, about 8,000 of which were being received on current subscription. A new periodicals acquisition program, supported in part by a grant from the Carnegie Corporation, is expected to add an additional 5,000 current titles by 1978.

The proposed single facility might be accomplished either by designation of the CRL as the comprehensive national central facility, or if a new national center facility were designated, by transfer of the CRL collection to the new facility.

6.2.2 Capacity of a Single Facility Center: Three Systems of Operation

Probably the most significant factor to be considered in judging the feasibility for developing a single facility for supply of all periodical needs for all users, is the ability of that single Center to supply the anticipated demand. As noted earlier, accurate anticipation of demand is impossible. In Chapter 7, however, estimates of possible low and high levels of actual satisfied demand have been calculated, based on the availability of materials (collection development) and likely patterns of demand. Table 6-1 shows the estimated average number of requests to be filled per day (based on an average of 250 working days per year) for low and high demand volume for the first ten years of a single facility Center.

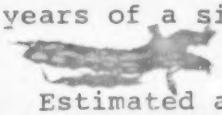

Table 6-1. Estimated average number of requests to be filled per day

Year	Low Demand		High Demand	
	Estimated Annual Loans	Loans Per Day*	Estimated Annual Loans	Loans Per Day*
1977	58,000	232	75,000	300
1978	158,000	632	212,000	848
1979	308,000	1,232	450,000	1,800
1980	541,000	2,164	859,000	3,436
1981	734,000	2,936	1,335,000	5,340
1982	984,000	3,936	2,040,000	8,160
1983	1,269,000	5,076	2,651,000	10,604
1984	1,585,000	6,340	3,426,000	13,704
1985	1,888,000	7,552	4,332,000	17,328
1986	2,281,000	9,124	5,462,000	21,848

* Based on 250 working days per year.

To meet these estimated levels of demand, three possible methods of operation are reviewed:

I. Manual system of storage and retrieval of originals

II. Mechanized system of storage and retrieval of originals

III. Automated system of storage and retrieval of microforms.

I. Manual System

The NLL of Great Britain utilizes a manual system of storage and retrieval of materials with a mechanical handling system for movement of materials within the building.[3] Current demand is reported at approximately 6,000 requests per day, of which about 90 percent, or 5,000 requests are for periodical materials. This level of demand on the NPRC is estimated at between the seventh and eighth year on the low demand chart and between the fifth and sixth year on the high demand chart. Dr. Urquhart of the NLL has noted that the current level of demand puts no appreciable burden on the system there, and states that NLL can support a many-fold increase without breaking down.

With a significant increase in demand, certain modifications in the internal handling procedures have been anticipated by the NLL staff. The NLL system involves removing materials from the shelves and conveying them to photocopying locations (or in cases of loans, sending them to users). Although multiple copies of heavily used materials (sometimes as many as six copies) are held, and an attempt is made to return materials to shelves as

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[3] Smith, E. S., "Materials Handling in the NLL's New Building," NLL Review 2:4:109-121 (October 1972).

rapidly as possible, this could become a bottleneck at some higher level of demand. Corrective action will involve a rearrangement of photocopying machines.

To prevent the problem of missing materials, particularly in a system with limited duplicate copies, it is suggested that photocopy machines could travel to the materials, thus obviating the need for removing the materials from the shelves. This should be rather simple to achieve by wheeling copy machines down the storage aisles, where a stack attendant had previously pulled the needed item, inserted the request at the proper page and placed it for copying. The copy machine operator would traverse a fixed path, copying designated materials, attaching the copy and request, placing them in a conveyor to the mail room and replacing the copied material on the shelf where it had been placed by the stack attendant. Requests would be batched and stack attendants could make periodic rounds of the aisles, reshelving copied materials and pulling new items. Should a new request for an item be circulated before the item has been reshelved, its location makes it immediately available without reshelving. Utilizing this method of operation, the number of requests filled per day could be increased by adding copying machines and stack attendants and decreasing the length of the path traversed.

It is anticipated that, initially at least, only a few duplicate copies of the same title will be held. Shelving will be planned on the basis of a 1986 volume of approximately 2,000,000 individual periodical issues stored (Table 6-2).

It has been estimated that the average photocopy request is about 10 pages. Current copy machines can average roughly 120 pages per hour, but operator productive time in a normal eight hour shift is estimated at 6.7 hours. This produces approximately 800 pages or 80 filled requests per eight hour shift.

Table 6-2. Number of issues in storage

Year	Number of Titles	Cumulative Number of Issues in Storage
1977	20,000	200,000
1978	30,000	450,000
1979	40,000	800,000
1980	46,795	1,169,875
1981	48,667	1,413,210
1982	50,614	1,666,280
1983	52,639	1,929,475
1984	54,745	2,203,200
1985	56,935	2,487,875
1986	59,212	2,783,935

Table 6-3 indicates the number of copy machines required to provide the estimated levels of demand each year assuming all loans are filled by photocopy with current equipment capabilities.

Table 6-3. Number of copy machines required

	Low Demand			High Demand		
	Copy Machines Required*			Copy Machines Required*		
Year	8 hours	16 hours	24 hours	8 hours	16 hours	24 hours
1977	3	-	-	4	-	-
1978	8	-	-	11	-	-
1979	16	-	-	23	-	-
1980	28	14	-	43	22	-
1981	37	19	-	68	34	-
1982	50	25	17	102	51	34
1983	64	32	22	133	67	45
1984	80	40	27	172	86	58
1985	95	48	32	217	109	73
1986	115	58	39	274	137	92

* Does not include stand-by machines for breakdowns.

Economy of operation (copy machines have a lower cost per page on higher volume) as well as the time differentials for the four time zones of the United States would suggest that the Center might well consider multi-shifts at certain levels of demand. Movement to a second shift might be considered when the volume of demand reaches between 4,000 and 5,000 requests per day, and to a third shift (24 hour a day operation) when it reaches 8,000 - 10,000 per day. The figures in Table 6-3 give some indication of possible problems in working spaces due to the difficulty of arranging an adequate floor plan for the number of photocopy machines required at high demand levels. We have assumed, for discussion purposes, that all loans are satisfied by photocopy, although some small percentage (e.g., 5-10 percent) of loans would involve original materials. It becomes questionable as to whether a facility designed to house 3,000,000 journal issues could provide efficient working space for the number of workers and machines at the higher demand levels.

With a high volume of use, the problem of wear and tear of materials must also be considered. It has been suggested that materials in heavy demand be protectively bound in single issue binders to prevent unnecessary deterioration and loss of paper. Although a number of librarians have commented on this problem of wear and tear from use of materials for photocopying, no information is available on which to base predictions of limits of possible use. Certainly the condition of materials must be constantly monitored and alternatives such as this devised if deterioration presents serious obstacles to full service by the Center.

II. Mechanized System (Originals)

The Randtriever, a product of the Sperry Rand Corporation, provides a mechanized system for retrieval of original materials

from compact storage. This sytem, viewed in operation at the Health Sciences Library of Ohio State University, selects a carrying box from the compact storage stacks by means of a message triggered by a mini-computer, and delivers it, by means of conveyor belts, to the requesting station. Each console is capable of retrieving and returning to stacks 20 items per hour, or 134 items per productive (6.7 hours) man-shift. Approximately two photocopying units would be required per console.

This system is based on random retrieval and does not require contiguous filing of related materials, so that new materials can be simply added in additional containers and new stack units and consoles added as volume of issues and demand requires. A simple index of storage locations would be utilized to retrieve materials.

Several problems are involved in heavy retrieval demands. Items needed are not recalled individually but in the full container which may contain more than 30 individual issues. Some delays in returning containers to storage may be occasioned by queueing of containers as new items are being recalled. This seriously enlarges the problem noted earlier of absence of materials from their proper location.

Although the system greatly reduces space requirements, this problem of material absence plus the relatively high cost of the system and comparatively low retrieval capacity do not particularly recommend it for a heavy volume demand service.

III. An Automated System (Microforms)

In developing concepts of a totally automated delivery system for materials, it was recognized that there are no operationally proven systems. As noted in Chapter 5, the effective delivery of materials is much impacted by the capacities of current methods of communications and delivery. In the near future, a center must rely for the most part on the postal delivery system -- a system whose undependability and delays are matters of daily censure. Alternatives must be considered in the future. Experiments by Project INTREX have demonstrated the technical feasibility of transmitting a microfiche image by cable to a remote cathode ray tube (CRT).[4] But in the foreseeable future such a system will not be economically feasible.

In order to determine current feasibility of an automated system of retrieval and reproduction of journal articles based on a microfiche collection, a conceptual outline was developed and submitted to John R. White, a technical systems consultant (and incoming president of the National Microfilm Association), for analysis and evaluation. In his report to Westat[5] White notes that no fully automated system is currently available, and that while mechanized retrieval of fiche with currently available equipment is both rapid and efficient, the cost of producing microfiche provides a serious constraint to development of such a system with a large number of titles.

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[4] Massachusetts Institute of Technology. Project INTREX. Semi-Annual Activity Report, 15 March - 15 Sept. 1972, Cambridge, Massachusetts: MIT, 1972, p. 69 (ED 066 207).

[5] White, John "A Report on the Feasibility of an Automated National Periodical Resources Center," Santa Cruz, California: J. P. White Consulting Services, November 1973. (A report prepared for Westat, Inc.)

Probably the ultimate determinant as to whether storage and retrieval should be based on microfiche copies of the entire collection or on original copies is the retention policy of the Center. If journal issues are to be retained beyond the probable useful life of the material so that eventual microfilming of materials is expected, the cost of reproduction ceases to be a factor in selection of operational methods, and usefulness of form as well as costs of origination and operation provide the determining factors.

The use of microfiche appears more reasonable in the case of a smaller number of heavily used titles. Certain deterioration considerations when items are heavily used could be relevant here, even if permanent retention is not in question. Developing a hybrid system utilizing mechanized storage and retrieval of microforms for very heavily used materials (possibly less than 1,000 titles) with manual storage and retrieval of originals for little used titles thus offers a feasible approach. Such a hybrid system should permit maximum speed and efficiency in retrieval and reproduction of materials, with the further capability of permitting, for the heavily used materials, cheaper duplication of the microform copy rather than the more expensive photocopy. According to White,[6] maintenance and utilization of a hybrid system presents no particular problems if access files are properly annotated.

Some note should be made of the current operation at the Associated Colleges of the Midwest (ACM) Periodicals Bank, where photocopies are supplied for materials stored on microfilm.[7]

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[6] Ibid.

[7] Lucht, Irma and Stewart, Blair, "The ACM Periodical Bank and the British National Lending Library: Contrasts and Similarities." Paper presented by Irma Lucht at the Conference on Management Problems in Serials Work. Florida Atlantic University. Boca Raton, Florida, March 1973.

Potentials for future automated delivery suggest that in any case, developments in automated methods be kept under continuous review in terms of cost feasibility, improved service, and increased capacity for providing the needed level of service.

6.2.3 Location of a New Center

The primary factors considered in the geographic location of the new Center should be service time and cost. For some years in the future the delivery of materials will depend on the U.S. Postal Service. Consequently, a location that takes advantage of the mail transportation patterns is desirable. Discussions with the U.S. Postal Service indicated that a central location near a major transportation hub and a Postal Service Sectional Center Facility should be sought. Chicago was suggested as the location that would probably take most advantage of the postal service patterns. This suggestion was not based on an investigation but from operational experience with the postal system.

Another factor to be considered in selecting an actual site is the cost. The final decision on location should treat the tradeoffs between delivery time and costs.

6.3 Configuration 2 - A Satellite System

Predicted volume of demand suggests the possibility of some duplication of centers in order to provide the required level of service. This method of operation was utilized by the National Library of Medicine in developing the Regional Medical Library Program when volume of demand at NLM had risen to a substantial level. It is suggested a multi-facility system, based

on small dedicated collections, be developed on somewhat the same model, that is, an expansion from a single comprehensive national resource.

Development, initially, of a single national facility should have early cost advantages over immediate development of multi-facilities. As demand increased at the single Center to a critical level, additional dedicated facilities could be stocked with a relatively small number (1,000 - 3,000) of heavily used titles from which photocopies could be provided to users within the region served by each satellite center. All requests would be submitted directly to the satellite center, with those requests not readily filled forwarded by teletype to the national Center. For cost-effective use of materials at the national Center, it is recommended that it operate also as the primary resource facility for its area, as does the NLM.

Requests forwarded to the national Center, which would house a complete collection from a given date forward (Configuration 1), would be filled there and photocopies forwarded directly to the user or requesting library as designated. Requests for materials not available at the national Center would be referred to other libraries or notification of inability to supply the material made directly to requester. No unfilled requests would be transmitted down through the satellite centers, since collection monitoring would be necessary only on the national level.

The necessity for providing duplicate copies (for the various satellite centers) suggests the practicality of utilizing microfiche collections for these titles with fiche prepared at the national Center where the archival quality master fiche would be filed and diazo copies provided for producing photocopies. High speed, semi-automated hard copy production equipment, which can be

leased at a per page rental cost, could provide fast, efficient reproduction for the several facilities.

Use of a dedicated microfiche collection of only the most heavily used titles would require only limited space and facilities at the satellite centers, while providing speedy regionalized access to a high proportion of the journal articles needed by users. The experience of the ACM Periodical Bank[8] should provide insight into the operation of a satellite center using microform materials. In 1972 the Periodical Bank held about 2,000 titles with most issues on microfilm.

Demand upon the smaller centers and the national Center would depend mainly on the number of satellite centers and the number of titles held in each center. As developed in Chapter 7, the 1,000 most used titles are expected to satisfy about 50 percent of the potential total demand, whereas 3,000 titles should satisfy about 75 percent of the demand. It will be assumed that the 3,000 most used titles would be available from the satellite facilities. If the nation was divided into four equal-demand regions, and the national Center served one region, the percentage distribution of total demand over the four facilities would be as follows:

Region 1 (National Center)	-	43 percent
Region 2	-	19 percent
Region 3	-	19 percent
Region 4	-	19 percent

With the demand projections given in Table 6-1, the four-region structure would reduce the estimated annual loans made by the national Center in 1986 from about 5.5 million to 2.3 million

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[8] Ibid.

under the high demand. Each of the other three regional centers would process about 1,038,000 loans in 1986. Such a regional distribution assumes the ability to divide the nation into four regions having roughly equal demand potential. One approach to this could be based on the four U.S. Census geographic regions, Northeast, North Central, South and West. The 1970 population for each of these four regions is such that the assumption of equal-demand regions is probably reasonable. Population should be a good indicator of potential demand for interlibrary loans.

6.4 Configuration 3 - A Regional Resource Network

Configurations 1 and 2 are predicated on development of new dedicated collections of periodical materials with a unique objective. But what are the possibilities instead, for more effective utilization of the rich periodical resources already available in the United States? Such resources could be utilized in several ways:

1. A single comprehensive collection could be designated and developed as a national resource center.

2. Utilization of multiple existing collections to provide a network of regional facilities for supply of the needed periodical materials. To back up these regional collections a national resource center could be developed, or an existing resource such as the CRL periodical collection (expanded) or the Library of Congress periodical collection could be designated and developed to provide those materials not available in the regional facility. This utilization of resources on a regional basis somewhat resembles the Regional Medical Library Program of the NLM.

The second approach offers the most promise, but before discussing the regional resource system plan in more detail, comments on the first possibility of using existing resources will be given.

6.4.1 Designating a Single Comprehensive Collection as National Periodical Resources Center

6.4.1.1 The Library of Congress Periodicals Collection

In discussing use of existing periodical collections, the substantial resources of the Library of Congress (at least 250,000 serials titles, current and retrospective) cannot be ignored--nor duplicated. While LC has expressed strong interest in the assumption of expanded roles in the delivery of information, some of these functions are essentially antithetical to more basic missions of the Library.

Use of materials is not conducive to their best preservation; the Library of Congress does not now lend journals although limited use in the reading room is permitted. Some photoduplicates of periodical articles are supplied. The handling of materials in the process of photoduplication, especially of materials in the heavily used part of the collection, in the volume which may be anticipated for an independent Periodical Resources Center, imposes a significant "wear" factor detrimental to their state of preservation. To utilize the LC collection, therefore, would require either a duplicate file of original issues of heavily used journals, or a microform copy of such issues for use by the Center.

Several other factors should be noted:

1. The location of LC on the East Coast of the United States does not maximize delivery to most parts of the country; a more central location is more desirable.

2. Labor costs on the East Coast, and particularly under a civil service structure, are higher. An operation based on use of original materials is labor intensive.

3. Adding additional functions to an existing operational structure eliminates the "unique mission" concept of the NPRC, tending to dilute possible efficiency as well as the ability to provide overall coordination to all aspects of periodical control and access.

Probably a more feasible role for the Library of Congress in the provision of periodical materials is that of backstopping the Center collections for materials not held. Clear cut lines of communication and access should be developed; possibly one or more Center staff members should be stationed at the Library of Congress to provide rapid access to such materials.

6.4.1.2 Other Collections

Other large periodical collections, such as that of the New York Public Library, have also been noted as possible bases for a national resources center. However, constraints similar to those noted for the Library of Congress collection will also apply:

1. Many of the large collections suitable for use are located in coastal areas, creating delivery problems.

2. Use of the collection would be a secondary function to the basic mission of the host library and tend to dilute the "unique mission" of the Center.

3. Some replication of titles of heavily used materials would almost certainly be necessary.

While use of an existing collection might well provide a possibility for rapid development of an initial service capability, such use might best be designed as a temporary expedient. In this way it could bridge the period of development of the Center collection to a predetermined level, and then provide a backup resource to it while the Center developed the collection depth necessary to meet more periodical materials needs.

6.4.2 Development of a Network of Regional Periodical Resources Libraries

Most promising comprehensive utilization of existing resources would appear to lie in development of a network of designated regional periodical resources libraries. It is assumed that a national body would take the responsibility for development of a national periodical resources system. Under the regional plan, the national Center would initially consist only of a small planning and coordinating staff. Libraries with existing strong periodical collections would be invited to express interest in becoming regional resource centers. Selection of participating libraries would be made on a basis that would result in national coverage with a number of regions. The national planning organization would contract with the designated regional resource libraries.

Past experience of the Regional Medical Library Program (RMLP) of the National Library of Medicine provides useful planning information in some areas, but substantial differences should be noted.

1. There is no designated national periodical collection responsible for universal access to periodical materials in the same manner as NLM has responsibility for providing access to materials in the health sciences.

2. Total demand in the RMLP, now about one-half million is considered to have leveled off. Anticipated demand in the provision of periodical materials for a national periodical resources system is expected to reach five to ten times that volume of demand within ten years.

3. RML service is provided by contract between the base library and NLM and operational control remains in the library system. Levels of service providing for three working day or four calendar day in-house turnaround are substantially slower than that desired from a national periodicals service.

4. Studies at the NLL and the ACM Periodical Bank[9] show that the titles in heaviest demand are titles that are widely available and heavily used in other libraries. In effect, heaviest demand is thus for those materials most likely also to be in heavy demand at the host library.

The first step in development of a regional network must be the identification of significant periodical resource collections in the United States. Although these resources will

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[9] Ibid.

be found primarily in large academic institutions, some large public libraries might also be included. Regional resource libraries should be selected on the basis of:

1. Collection strength
2. Location
3. Willingness to provide the required service

Each designated library would be supplied with a dedicated collection of about 3,000 most heavily used titles. This may begin with the current issue of the titles or include a one-year backfile of these titles if collection begins prior to inception of service. As suggested in Configuration 2, this small dedicated collection might well be a microfiche file to provide fast, cost-effective hard copy with minimum space and material procurement costs.

Development of demand is expected to be gradual, so that by the time volume of demand has reached a point where the host collection is unable to meet needs for recent retrospective materials it is assumed that the dedicated collection would be meeting almost all needs for heavily used titles. The dedicated collection should ultimately fill about half of all requests received.

Requested materials not in the dedicated collection would be supplied by utilization of the local library periodical resources. Several methods provide possible solutions to the supply of materials not included in the host collection.

1. A union list of holdings of the regional facilities (preferably machine readable and on-line) would permit rapid referral to another regional library which holds the required item.

2. Arrangements could be made with the Library of Congress for supply of materials held there not available at any of the regional facilities.

3. Similar arrangements could be made with CRL, and periodical holdings there included in the union list.

4. A national center could be established and gradually build the required backup collection. This center might be based on such a collection as the CRL periodical resources.

Initially, regional facilities would be required to make referrals to appropriate locations and monitor unfilled requests. As a national backup resource capability developed, regional facilities would continue to receive all requests for materials originating from users in their regions, but unfilled requests would be transmitted, without verification or other referral, directly to the national backup resource as in Configuration 2.

To provide the most effective and fastest service, it is suggested that the regional operations be independent of the host library service, though located within the host facility, and not a part of the library ILL operations. This would require establishment of an independent operation, such as provided by MINITEX at the University of Minnesota or WILS at the University of Wisconsin, under control of a centralized authority which controls all aspects of the national network.

The University of Minnesota has expressed some interest in development of a pilot project at that institution to test the feasibility of a regional facility utilizing resources of a host institution, based on their experience with the MINITEX project. MINITEX provides a good example of an existing operation that could be expanded to serve as a regional facility.

The Minnesota Interlibrary Teletype Exchange (MINITEX) program began in 1968 as a two-year experimental project to test the feasibility of sharing the library resources of the University of Minnesota with libraries located in other parts of the state. The University of Minnesota library is the only major research library in the state and has in its collection over three million cataloged volumes. The results of the experimental project revealed considerable benefits to the state without undue detrimental effects on the service to the University's faculty and students.

As a result of the inital success, MINITEX is now funded by the state through the Minnesota Higher Education Coordinating Commission who contracts with the University to provide the service. The number of participating libraries has expanded to include academic, public, and special. About 80,000 interlibrary loan requests are received annually with approximately 85 percent of the requests filled.

As the name of the project implies the participating libraries are linked to the MINITEX office (University Library) by TWX for all incoming requests. A variety of delivery procedures are used, including mail, courier, United Parcel Post and Greyhound Bus.

The success of MINITEX is due, in part, to several basic policies. All incoming requests are received over TWX reducing the input time. Materials are prepared for delivery within 24 hours of receipt of requests and most items are available in the patron's library on the second working day. This kind of service has been possible by keeping operational procedures as simple as possible. An important bibliographic tool that contributes to the success in lending serials material is the Minnesota Union List of Serials (MULS). Starting with about 39,000

current titles received by the University the machine-readable data base now includes 80,000 titles owned by the University and other cooperating libraries. The two-volume record was available for use in 1972 and represented one of the first comprehensive serials list in the MARC format. Location of the requested title in MULS by the requesting library eliminates much of the verification that would otherwise be required by the MINITEX staff.

Other existing service organizations such as WILS at the University of Wisconsin, Pacific Northwest Bibliographic Center at the University of Washington, and a number of strong libraries around the country are examples of potential regional resource centers.

7. ECONOMICS OF CONFIGURATIONS

It is safe to surmise that from the outset of this study most librarians agreed that the single most important variable or factor associated with the concept of a national system for periodical materials is the cost. Based on the demonstrated success of the U.K.'s National Lending Library for Science and Technology, few doubted the benefit of such an operation given that the cost was not prohibitive. The purpose of this chapter is to present cost estimates for each of the alternative configurations developed in the previous chapter.

Cost estimates have been projected for future years by inflating current estimates on the basis of what appears now as reasonable inflation rates. We are aware of the pitfalls of economic forecasting based on past trends, and the estimates given in this chapter should be considered in light of the present uncertainty of most economic forecasts.

7.1 Cost Elements

The first step in costing any operation is the identification of cost elements, those factors that contribute to the cost of putting the operation into being initially and sustaining it over time. We are interested in the investment costs and the annual operating costs for each alternative configuration over a ten year planning period. Investment costs are those costs that are incurred, generally, on a one-time basis or at periodical intervals such as costs for a new physical plant. Accounting procedures used by most commercial enterprises call for capitalization of investment costs which allows for amortization over the life of the asset. This is not common practice in the case of

educational plant assets. The actual accounting procedures adopted by a national system would depend on its organizational status and the associated requirements. For our purposes in costing the various alternatives, we will consider the total costs at the time they are incurred. The only exception to this might be in the building and equipment in the case where they are purchased outright rather than leased. Equipment purchases include items such as shelving, microform cameras and storage devices, furniture, data processing and office equipment, and any mechanical material handling devices. Certain other equipments would be more likely obtained as rentals such as photocopy machines, teletype terminals and computer time.

The annual operating costs are those costs that recur each year of operation. Included in the operation of a national periodicals system are the following annual costs:

1. Collection - subscriptions and binding.
2. Facilities - building improvements, handling and office equipment, maintenance, and utilities.
3. Staff - salaries, hourly wages, and benefits.
4. Photocopy - machine rental.
5. Communications and delivery - telephone, teletype and postage.
6. Other - supplies, staff travel, promotion and training materials, and miscellaneous.

The cost elements could be conceptually classified into fixed and variable costs, where the variable costs are functions of the demand. In practice, most costs have a variable component even though they may be perceived as fixed, e.g., the annual building lease. At some point in demand, a building of a given size is no longer adequate and additional space must be obtained

if the future demand is to be met. For our purposes, based on a ten year planning period, the primary variable costs are staff, photocopy machine rental, and communications and delivery.

7.2 Estimating Future Potential Demand

In terms of planning a new national system for handling requests for periodical materials, a key variable is demand for the services. As alluded to above, certain costs incurred in the operation of a center will be directly proportionate to demand. Although the demand is an important variable needed for planning, it is most difficult to estimate. The difficulty is particularly acute in the case of a new service where the service becomes available to a large number of potential users that the existing service has not served, as is the case of improved access to periodical resources. In addition to this enlarged user group, a new system with fast dependable service will replace certain titles currently acquired and stored in libraries, hence providing another source of potential demand. It will be worthwhile to distinguish between potential demand and satisfied or actual demand.

The starting point for discussion of potential future demand is the estimated actual demand of the present ILL system as presented in Chapter 3. Based on a straight-line extrapolation of past experience, Table 3-12 showed that the estimated number of requests received by academic libraries for periodical materials is expected to increase from about 1 million to 1.6 million by 1980. Again, these figures were based on six years of historical data, and from the point of view of good forecasting principles we have already overextended the data in forecasting eight years. It is usually not considered good practice to

extrapolate further into the future than the number of years covered by the past data.

For planning purposes in this study, we have adopted the ten-year period 1977-1986. Under each of the three configurations, lending services are planned to begin January 1977. We now require a rationale for adjusting our historical estimates of demand above to that of a new system. One could approach this by considering the new sources of demands, i.e., those public libraries, special libraries and academic libraries not now served under the present ILL system. The problem with this approach is, that at this time, data on the interlibrary loan activities of public and special libraries are not available. Stevens[1] encountered this problem in attempting to estimate the total volume of interlibrary loans in the U.S. He found, based on very sketchy evidence, that for every ILL request received by academic libraries 3.8 loan requests were received by nonacademic libraries. Applying this factor to the Westat[2] academic data he estimated a total of 10,500,000 interlibrary loan requests handled by all types of libraries in 1972-73. One might ask what proportion of this total would be for periodical materials and, perhaps, be willing to use that as a starting point to speculate on what percent of that would be in a new system. Even if a good estimate of the nation's total interlibrary loan requests was available, it would still be difficult to estimate the proportion that would be for periodical materials. In the case of public library systems,

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[1] Stevens, Rolland E., A Feasibility Study of Centralized and Regionalized Interlibrary Loan Centers, Washington, D.C.: Association of Research Libraries, 1973.

[2] Palmour, Vernon E., Bryant, Edward C., Caldwell, Nancy W., and Gray, Lucy M., A Study of the Characteristics, Costs, and Magnitude of Interlibrary Loans in Academic Libraries, Westport, Connecticut: Greenwood Publishing Company, 1972.

periodical requests probably account for less than 10 percent of all ILL requests.[3] But, for special libraries, periodicals should make up a much larger percent of the total.

A further complication in estimating potential demand under a national plan is the question of how many of the existing periodical requests would be covered. It is assumed that state systems like New York and Illinois would continue to process requests for periodical materials held in their systems and only come to the national system for items not available in-state.

One approach to estimating the demands on a periodical resources center is to inspect the components of the existing demand upon academic collections and speculate on what would be likely to shift to a national center or system. This rationale is displayed in Figure 7-1 with the expected amount of demand shifted to a national system designated by the letters A - E. We estimate that roughly 455,000 loan requests would be received by a new national periodicals center or system based on the 1969-70 data. Extrapolating the 1969-70 estimate to 1977 calls for increasing the 455,000 by a factor of 1.35 for an estimate of 613,000 loan requests for the first year of a national operation. This figure of 613,000 is roughly half of the total periodical requests forecast for the year 1976-77 under the present ILL system (Table 3-12, Chapter 3).

The future potential demand of a new center would be likely to grow at a rate much greater than the growth rate of periodical requests in the present ILL system. Dr. Urquhart,

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[3] Palmour, Vernon E., and Gray, Lucy M., Costs and Effectiveness of Interlibrary Loan and Reference Activities of Resource Libraries in Illinois, Springfield, Illinois: Illinois State Library, 1972, p. 18.

Figure 7-1. Estimate of existing academic demand that might shift to system (based on Westat 1969-70 figures for all subject areas)

Total periodical requests to academic libraries		930,000	
	20.4% unfilled	189,720	
	50% of unfilled		95,000 A
Total periodical requests filled		740,280	
	29.1% out of state	215,420	216,000 B
	In state	524,859	
	10% of in-state requests		53,000 C
Total periodical requests made by			
	academic libraries	540,000	
	less 82% to other academic libraries	443,000	
	nonacademic requests	97,000	
50% of requests to nonacademic			49,000 D
	Subtotal		413,000
10% of total (current ineligibles)			42,000 E
			455,000

Director, National Lending Library for Science and Technology, Great Britain, has stated that one problem he has failed to solve is that of predicting demand.[4] Realizing the difficulties in predicting potential demand for a national periodical resources

[4] Urquhart, D. J., "Planning Library Services - National Libraries," in Planning Library Services. Edited by A. Graham MacKenzie and Ian M. Stuart, Lancaster, England: University of Lancaster Library, 1969.

system, we have adopted two sets of estimates, a conservative or low growth and a high growth. For planning purposes, it is important that a new center be designed to handle a higher level of demand than normally expected. For this reason, our designs should be able to process the higher number of requests if necessary. The two sets of potential demand figures for planning purposes are given in Table 7-1. The "low" growth rate is based on the NLL's growth rate which averages about 22 percent annually over the ten-year period. For the high growth rate, we have assumed an average annual growth of 40 percent for the first five years and a 20 percent rate for the next five years. The first year estimate under the high growth rate was arbitrarily set at about 30 percent above the corresponding low demand estimate.

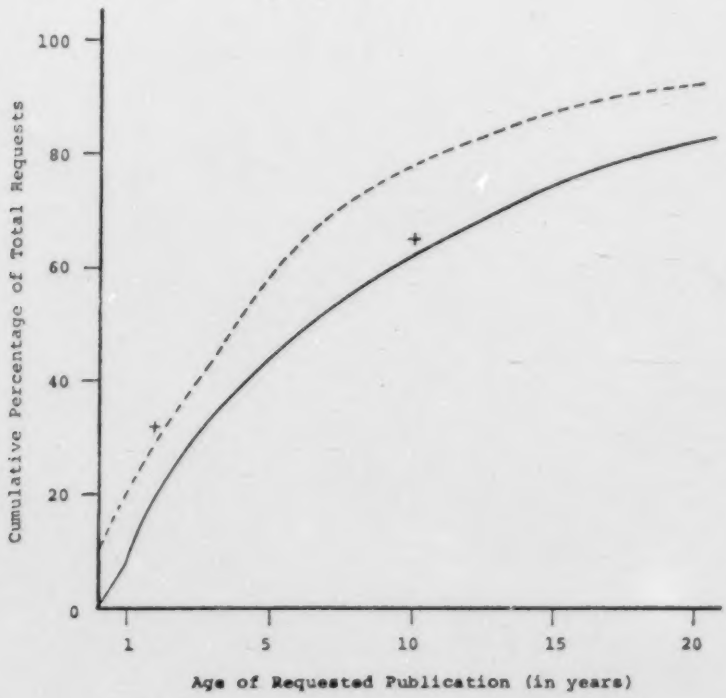
Table 7-1. Predicted future potential demand for a national periodical resources system, assuming a full comprehensive collection

Year	Low Growth Rate	High Growth Rate
1977	613,000	790,000
1978	821,000	1,106,000
1979	1,060,000	1,548,000
1980	1,367,000	2,168,000
1981	1,668,000	3,035,000
1982	2,051,000	4,249,000
1983	2,441,000	5,099,000
1984	2,831,000	6,118,000
1985	3,200,000	7,342,000
1986	3,680,000	8,810,000

The demand under the high growth rate should be a reasonable upward boundary for design purposes. For comparison the NLL received about 1.5 million requests in 1972. The demand estimates in Table 7-1 also assume that the national periodical resources system has a collection covering all dates and titles.

In other words, the figures represent potential demand on a comprehensive collection. In the case of a new facility with a collection starting at a certain date, say 1976, estimates are needed on the proportion of total demand that these holdings will satisfy. Two aspects of the collection of a new system are required, 1) the distribution of demand by age of periodical material requested, and 2) the distribution of demand as a function of the number of titles owned. Wood[5] found the distribution of periodical requests as a function of age shown by the solid line in Figure 7-2, for the field of science and technology.

Figure 7-2. Frequency of periodical loan requests versus age of the requested publications



[5] Wood, James, L., A Review of the Availability of Primary Scientific and Technical Documents Within the United States, Volume II. Columbus, Ohio: Chemical Abstracts Services, October 1969, p. II.66 (ED 046438)

Data from Table 3-5, Chapter 3, indicates that the Westat data for periodical requests across all subjects would follow Wood's curve reasonably closely as shown by the +'s. The broken-line curve gives the results of a 1963 survey by NLL for what at that time was primarily science and technology. Again in 1968, similar results were found in the social science area.[6]

Periodical requests are satisfied by a relatively small number of titles. Wood[7] found that 12,282 titles were requested in his sample of 70,686 interlibrary loan requests. Fifty percent of all requests could be satisfied with 850 titles. Twenty-five percent of demand was for 195 titles. About 2,700 titles satisfied 75 percent of the requests and over 92 percent of all demand was for about 6,800 titles. Experience at the NLL is similar, in that approximately 80 percent of the total demand was satisfied by only 10 percent of the total titles owned (about 15,000). Wood and Bower[8] found for the social science periodicals that about 50 percent of the demand was for 100 titles and that about 300 titles satisfied 80 percent of the requests. For planning purposes, we shall assume the following distribution:

- 1,000 titles will satisfy 50 percent of total demand
- 3,000 titles will satisfy 75 percent of total demand
- 10,000 titles will satisfy 95 percent of total demand

Combining the predicted potential demand for periodical titles, based on a collection spanning all ages and subjects (Table 7-1), with the distribution of demand by age and number of titles,

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[6] Wood, D. N. and Bower, C. A., "The Use of Social Science Periodical Literature," Journal of Documentation. 25:2, 108-122 (June 1969).

[7] Wood, James L. Op. cit., p. II.63-4.

[8] Wood, D. N. and Bower, C. A. Op. cit., p. 114.

actual demand can be estimated for various alternative configurations of a national system. For example, assume that a national center will become operational in January, 1977 with a collection of 10,000 titles covering all subjects with one year of back issues. In predicting the first year demand, 10,000 titles should cover 95 percent of the requests or 582,000 requests under the low growth rate across all ages. With a one year backlog for titles, the center could expect to meet about 10 percent of the requests (Figure 7-2) for a total estimated demand of 58,000 requests for the initial year of operation.

Demand and cost estimates will be tailored to each proposed alternative configuration of a national periodical resources plan. Each of the three alternative configurations requires cost estimates in order to compare them. Cost estimates presented are, for the most part, gross estimates. The primary purpose is to develop estimates for comparisons; consequently, the estimates are not intended as budget figures.

7.3 Configuration 1 - A National Periodical Resources Center

The first configuration to be costed is that of a single new center designed to acquire, store and make available all the worthwhile periodical materials in science and technology, social sciences and humanities. The bulk of loan requests would be satisfied by photocopy from the original materials. The planned schedule for the establishment of the center is as follows:

1975 Establish organization, recruit management staff, locate building site, and place subscriptions to be received in 1976.

1976 Move into building and continue to increase orders.

1977 Start lending services with 10,000 titles with one full year, 1976, on shelves.

Each of the cost elements shown earlier in this chapter will now be developed for Configuration 1 over a ten-year planning period from the date of opening, 1977-1986.

7.3.1 Collection Cost

Barr[9] estimated that by 1980, the number of worthwhile serials will be 60,000 based on 42,000 titles in 1971 and a four percent growth per year. These figures are based primarily on the U.K.'s NLL experience. The average 1971 price for periodicals in the U.S. was $11.66 with annual increases averaging 10.4 percent.[10] For our planning, we shall assume the number of periodicals and the average subscription prices as shown in Table 7-2. A four percent annual increase was assumed for growth in the number of titles and a ten percent annual price increase. The first year subscription price was computed by inflating the 1971 price of $11.66. The figure of 40,000 available worthwhile titles was arrived at from the fact that NLL is now receiving about 40,000 current titles with another 4,500 on order and by 1975 should stock about 50,000 current titles. The National Periodical Resources Center would exclude about 10,000 of these titles as either strictly medical or already available from CRL. It is also assumed that the number of titles would include some duplicate copies for certain heavily used titles.

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[9] Barr, D. R., Trends in Book Production & Prices, London: National Central Library, January 1972, p. 25.

[10] Ibid., p. 40.

Table 7-2. Estimated number of worthwhile periodicals and average subscription prices

Year	Number of Titles	Average Price per Title
1976	40,000	$18.78
1977	41,600	20.66
1978	43,264	22.72
1979	44,995	24.99
1980	46,795	27.49
1981	48,667	30.24
1982	50,614	33.27
1983	52,639	36.59
1984	54,745	40.25
1985	56,935	44.28
1986	59,212	48.71

The NLL obtains about 20 percent of their purchased serial titles through exchange programs. A high proportion of titles from Eastern Europe are received by this means. The U.S. facility would operate in a similar manner, but for costing purposes no distinction is necessary. Gifts might also account for a small number of current titles, although it is anticipated that gifts would primarily be for back issues of current titles and back runs of dead titles.

The remaining factors required to estimate the first year's collection cost are the number of titles that can reasonably be acquired and made ready by the planned opening date and the binding requirements. As indicated earlier, the schedule calls for placing orders for 1976 issues with an opening date of January 1977. A realistic phase-in for purchase of titles is to commence with 10,000 titles for the full year of 1976 and increase the annual subscription orders by 10,000 titles annually until the full number of worthwhile titles (Table 7-2) is obtained. In the second year and subsequent years during the phase-in, back

issues of the new subscriptions will be purchased to give a complete collection from 1976 onward.

NLL has developed a special binding, called part-binding, for single issues of heavily used materials. Part-binding costs run about 10 percent of the annual cost of literature. Using a similar method for binding in the Center the annual acquisition cost will be increased by 10 percent for the total collection cost.

The number of titles purchased each year, the number of individual issues or volumes and the estimated collection costs are shown in Table 7-3. Williams, et. al.,[11] found in a sample

Table 7-3. Estimated annual collection cost

Year	Number of Titles	Number of Titles for Back Orders	Number of Volumes	Estimated Total* Collection Cost
1976	10,000	-	50,000	$ 206,600
1977	20,000	10,000 (1 year)	150,000	681,800
1978	30,000	10,000 (2 years)	250,000	1,249,600
1979	40,000	10,000 (3 years)	350,000	1,924,200
1980	46,795	6,795 (4 years)	369,875	2,236,900
1981	48,667	-	243,335	1,618,900
1982	50,614	-	253,070	1,852,300
1983	52,639	-	263,195	2,118,700
1984	54,745	-	273,725	2,423,800
1985	56,935	-	284,675	2,773,200
1986	59,212	-	296,060	3,172,600

* Includes literature purchases plus 10 percent for binding.

[11] Williams, Gordon, et. al., Library Cost Models: Owning Versus Borrowing Serial Publications, Chicago, Illinois: Center for Research Libraries, November 1968, p. 87.

of 461 titles that the average frequency of issue was about five times per year. Applying this figure to the number of titles, the estimated number of volumes can be computed. The cost of back issues was assumed to be equal to the average price in the year of purchase, e.g., the assumed price in 1977 for 1976 issues was taken at the average 1977 price.

7.3.2 Facilities Cost

Building costs will depend on several factors, i.e., location, type of structure, size and internal improvements. The size of the building should be sufficient to house the anticipated collection for ten years before new facilities or major modifications are required. To determine that size, the estimated number of volumes accumulated annually was given in Table 7-3. By 1986, the total number of volumes for storage is about 3,000,000 items. Estimates on the amount of space needed vary depending on the number of volumes stored per square foot of space. The NLL stores about 10 single volumes or parts per square foot of storage space. Williams[12] used 15 single volumes per square foot for determining storage costs. If we assume 10 single volumes per square foot of space, the necessary storage space is 300,000 square feet. The NLL currently has 220,000 square feet of total floor space with about 184,000 square feet devoted to storage area. Adding another 20 percent of floor space to the 300,000 square feet of storage area, about 360,000 square feet of total space will be required.

In order not to incur a large cost outlay in the early years, or a large indebtedness, it was assumed that a building would be obtained through a long-term lease. Annual leasing

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[12] Ibid., p. 72.

costs normally run from $1.25 per square foot for unimproved warehouse spaces up to about $5.50 per square foot for improved office space with air-conditioning for space located in the fringe of an urban area. Based on estimates from three different areas, we have assumed $3.00 per square foot for a building without shelving and mechanical handling equipment. For comparative purposes, the United States Book Exchange, Inc. located in a light industrial area in Washington, D.C. leases their building for about $1.50 per square foot. This figure includes office space and storage space but without air-conditioning. It is estimated that the cost to construct a new building would run between $18 and $25 per square foot including land finishing. Land cost could amount to another $2.00-$2.50 per square foot. These building costs compare to costs in the range of $30-$50 per square foot for general academic libraries under construction in 1973.[13] The average cost reported for the new academic libraries was $36.25 per square foot for the building.

In addition to the basic building costs, the improvements consisting of shelving, mechanical handling equipment, office equipment, and other miscellaneous items such as book trucks, etc. must be included. Based on the NLL experience with their new facility, it is estimated that shelving and mechanical handling equipment will add another $0.75 per square foot to the annual lease cost. Annual maintenance, building services for cleaning and utilities (heat, electricity, water, and trash pickup) will cost roughly $0.60 per square foot. This results in an initial annual lease cost of $4.35 per square foot of total space.

The first year lease cost, assuming the total of 360,000 square feet required to house the expected ten-year collection

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[13] Orne, Jerrold. "Academic Library Building in 1973," Library Journal 98:21, 3511-3516 (December 1, 1973).

would amount to an estimated $1,566,000. Since less space is required in the early years, options for occupying the full spaces might span several years and, perhaps, lower the lease cost. For planning purposes, we have assumed the full-space cost annually. We have further assumed that the ten-year lease agreement for the building would call for $3.00 per square foot during the first five years and would increase to $3.75 for the last five years. Consequently, the total annual cost for facilities is $4.35 per square foot for the first five years and $5.40 per square foot for the next five years. The latter figure also includes an increase of $0.30 per square foot for utilities and building services.

7.3.3 Staff Cost

Staff costs depend on the staffing pattern of the center and the amount of business transacted. About the only experience with the type of operation under consideration is that of the NLL. The NLL's staffing philosophy is based on the application of scientific methods to the planning and operation with all the professionals recruited as members of the scientific civil service.

The senior management for a center should include the following positions:

1. Director
2. Two Special Assistants to Director
3. Deputy Director
4. Assistant Director Administration
5. Assistant Director Supportive Services
6. Assistant Director Operations

For more detail on organization refer to Chapter 9. The senior staff would consist of about seven individuals and the number should remain reasonably stable over the first ten years. The size of the remaining staff, for the most part, is a function of the number of titles and requests processed by the center each year.

The predicted future potential demand for a National Periodical Resources Center was given in Table 7-1. Based on the build-up of the collection, estimates are required on the actual demand that can be satisfied. Configuration 1 assumes a start-up with only one year back issues of 10,000 titles and expanding as shown earlier in Table 7-3. Applying the age distribution in Figure 7-2 and the planning factor of 95 percent of total demand satisfied by 10,000 titles, the estimated actual demand is given in Table 7-4. The calculations assumed that the 10,000 titles

Table 7-4. Estimated actual demand for Configuration 1

Year	Low Growth Rate	High Growth Rate
1977	58,000	75,000
1978	158,000	212,000
1979	308,000	450,000
1980	541,000	859,000
1981	734,000	1,335,000
1982	984,000	2,040,000
1983	1,269,000	2,651,000
1984	1,585,000	3,426,000
1985	1,888,000	4,332,000
1986	2,281,000	5,462,000

could satisfy 95 percent of potential demand with one percent increments up to 1981 where the number of titles being acquired by the center should conceptually satisfy all the potential demand. The potential demand was then reduced by the available back files,

with only 10 percent of the first year's potential demand being satisfied by the back file of one year. For the first four years this was incremented annually by 10 percent, and by 1980 the back issues are sufficient for 40 percent of the potential demand. From 1980-1986 the annual increment in increased demand satisfied from the build-up of back files averaged four percent annually. Consequently, in 1986 the current titles owned and the available back files are expected to satisfy about 62 percent of potential demand. This is not to be confused with the expected fill rate of the Center. It is assumed that borrowers will realize that the Center's collection commences with 1976 and will not send requests for older material. In actual practice the Center should develop a referral plan sometime during their early history, but for costing purposes this service has not been considered.

With the predicted demand for services, it is now possible to estimate the number and cost of the staff. The staff will only be broken into three classes for costing purposes, professional, nonprofessional, and part-time. The first two classes are permanent staff members receiving salaries and benefits. Part-time workers are paid by the hour and receive no benefits. The following distribution of employees by these classes is assumed:

Professional Staff	15 percent
Nonprofessional Staff	75 percent
Part-time Staff	10 percent

The NLL professional staff (1973) is about 14 percent based on 44 professionals out of 314 total staff.

Furthermore, the following average annual salaries and wages apply:

Professional Staff	$22,500
Nonprofessional Staff	11,250
Part-time Staff (FTE)	8,000

Fringe benefits of 25 percent are included in the first two classes. Annual increases of five percent are anticipated for each category. Combining staff mix with the average annual salaries and wages the cost per full-time equivalent across all staff is approximately $12,600.

In analyzing the number of staff as a function of loans satisfied for NLL, NLM and MINITEX the following working rule was developed:

- One person for every 5,000 requests satisfied.

Applying this rough working rule, the total staff requirements are given in Table 7-5. Staff costs were computed by multiplying the number of full-time equivalent employees by the average annual salary rate of $12,600 for the first year. Each subsequent year's salary rate is inflated five percent. To account for the heavy input of new titles requiring preparation for shelving the number of staff arrived at by the working rule was increased by 15 staff for the first four years.

7.3.4 Photocopy Cost

Photocopy costs have been computed based on 90 percent of all loan requests being satisfied with photocopies and the average length of an article being 10 pages. Use factors,

Table 7-5. Estimated staff size and cost

Year	Low Growth Pate		High Growth Rate	
	Staff Size	Staff Cost	Staff Size	Staff Cost
1977	27	$ 340,000	30	$ 378,000
1978	47	622,000	57	754,000
1979	77	1,070,000	105	1,459,000
1980	123	1,794,000	187	2,728,000
1981	147	2,251,000	267	4,089,000
1982	197	3,168,000	408	6,561,000
1983	254	4,289,000	531	8,966,000
1984	317	5,620,000	686	12,163,000
1985	378	7,037,000	867	16,141,000
1986	457	8,933,000	1,093	21,366,000

assuming average machine operators, were applied to determine the number of machines to accomplish the amount of daily photocopying. The following monthly rate schedule per machine was used:

1 - 12,000 pages	$.034 per page
12,000 - 30,000 pages	$.0265 per page
30,000 - 50,000 pages	$.018 per page

These rates were inflated 3-1/2 percent every two years yielding the estimated photocopy costs in Table 7-6.

7.3.5 Communication and Delivery Costs

Telephone, telex (teletype), and postage are included under communication and delivery costs. The telephone service cost is estimated as a function of the number of professional staff assuming $400 per professional person the first year. This

Table 7-6. Estimated photocopy cost

Year	Photocopy Cost	
	Low Growth Rate	High Growth Rate
1977	$ 17,000	$ 21,000
1978	44,000	58,000
1979	87,000	126,000
1980	152,000	236,000
1981	206,000	380,000
1982	281,000	576,000
1983	372,000	770,000
1984	461,000	995,000
1985	570,000	1,311,000
1986	689,000	1,653,000

rate is inflated at five percent annually. Telephone expenses are shown in Table 7-7.

Telex costs have been estimated on the assumption that 50 percent of incoming requests are by this means. For incoming requests, costs are for machine rental only. A small number of outgoing messages would be expected also; an arbitrary estimate of five percent of the requests will require a followup message from the Center. Rental rates for 1973 were inflated at an annual rate of 1-3/4 percent. Table 7-7 contains the cost estimates for telex services.

In order to estimate postage costs, it was assumed that all satisfied requests are delivered by First Class mail. The average photocopy is 10 pages and weighs about 2-3 ounces. First Class rates (December 1973) are eight cents per ounce up to 12 ounces and a flat $1.00 for over 12 but less than 16 ounces. These rates are due to increase during 1974 to 10¢ per ounce. We have assumed price increases to a rate of 14¢ per ounce by 1977 and the average weight of three ounces for a per item postage

Table 7-7. Estimated annual costs for communications and delivery

Year	Low Growth Rate				High Growth Rate			
	Telephone	Telex	Postage	Total	Telephone	Telex	Postage	Total
1977	$ 2,400	$ 3,400	$ 29,200	$ 35,000	$ 2,400	$ 3,900	$ 37,800	$ 44,100
1978	3,000	7,100	83,400	93,500	3,600	8,700	111,900	124,200
1979	5,100	12,000	170,000	187,100	6,900	27,400	248,400	282,700
1980	8,500	19,600	311,600	339,700	13,000	30,300	494,800	538,100
1981	10,700	26,500	440,400	477,600	19,500	47,200	801,000	867,700
1982	15,100	35,800	625,800	676,700	31,200	73,900	1,297,400	1,402,500
1983	20,400	47,100	852,800	920,300	42,700	97,100	1,781,500	1,921,300
1984	26,800	59,900	1,122,200	1,208,900	57,900	127,500	2,425,600	2,611,000
1985	33,500	72,900	1,404,700	1,511,100	76,900	165,500	3,323,000	3,465,400
1986	42,600	89,800	1,779,200	1,911,600	101,800	212,700	4,260,400	4,574,900

cost of 42¢ in the first year of operation. For original items loaned, the average weight per item was assumed to be nine ounces, or three times the per item cost for photocopies. A five percent inflation rate is used for subsequent years. The number of outgoing items, in terms of the estimated satisfied demand, was given in Table 7-4. Outgoing items reflect the mix of 90 percent photocopies and 10 percent original loans. Annual postage costs are given in Table 7-7. A small amount of additional postage costs for business correspondence is included in "other" costs.

For cost estimation purposes, total reliance on the U.S. Postal Service has been assumed. The Center should consider other delivery means if service can be improved at reasonable costs. The United Parcel Service (UPS) could possibly be used if requests to a single large user were batched, resulting in a package meeting UPS standards. Letter envelopes and manila envelopes are not handled, and the minimum acceptable envelope-type packaging is described as an insulated mailing bag. Rates for UPS are based on weight and distance with a minimum charge of 55¢ for an item weighing one pound or less. The UPS charge for this delivery of an original loan is less than the corresponding First Class mail costs.

7.3.6 Other Costs

The final group of costs includes supplies, staff, travel, promotion and training materials, and miscellaneous expenses. Supplies are expected to be the largest of these expenses covering the office and storage areas. We have assumed that other costs will amount to three percent of the total costs for collection, facilities, staff, photocopy, and communication and delivery.

7.3.7 Estimated Total Annual Costs for Configuration 1

In the preceding sections the individual cost elements contributing to the total annual operating cost, have been estimated for a single new periodical resources center. Costs were developed for the first ten years of actual service from the planned opening date of January 1977.

The planned schedule calls for the organization to be established and the management staff recruited in 1975. A building would be commenced for occupancy in 1976. Additional staff would be required in 1976 to check-in materials and ready the facility for opening in 1977.

The initial year of 1975 would be devoted primarily to planning, and it is assumed that four senior management staff would be recruited. In addition to the four professionals, one secretary and one clerk would make up the staff in 1975. The staff costs for salaries and benefits are estimated at $148,000. Office space would cost $11,000 including utilities and services. Furniture, supplies, travel, and communications should run another $25,000 giving a total annual cost of $184,000 for the first year.

Operations will continue at about the same level for the first half of 1976, with increased activities in the last six months. A building should be ready to occupy during this period. The expenses for the first six months are estimated at $100,000. In the last six months the following expenses would be incurred:

Literature	$207,000
Facilities	500,000
Staff	150,000
Other	50,000
Total	$907,000

The above cost for literature consists of the subscription and binding expense for 10,000 titles. Facilities cost is based on availability of the building for the last four months of 1976. Increased staff size accounts for the incoming literature and readying the building.

The estimated total cost for 1976 is $1,007,000. Center opening is planned for January 1977. Estimated annual costs for the first ten years of operation are shown in Table 7-8 for the low growth rate and in Table 7-9 assuming the high growth rate.

7.4 Configuration 2 - A Satellite System

The second configuration considered for the national periodical resources system is a multi-location system. A national center, identical to Configuration 1, would serve as a backup resource to a number of small dedicated collections located throughout the country on a regional basis. In Chapter 6 a system with a national center and three satellite centers was introduced. The three satellite centers would contain the most heavily used 3,000 titles. The national center would serve as one regional library also.

Establishment of a satellite system of dedicated collections would commence with early development of the national center, Configuration 1. The three regional centers would be planned for introduction in 1982 with one full year of back issues (1981).

Before estimating the cost elements, an estimate of demand for the satellite centers is required. We assume the same estimated actual demand developed under Configuration 1 (Table 7-4) for the high growth rate. It is assumed that a single center, the NPRC, could adequately meet the demand under the low growth

Table 7-8. Estimated total annual costs for Configuration 1 - a National Periodical Resources Center - low growth rate

Year	Cost Element						
	Collection	Facilities	Staff	Photocopy	Communications and Delivery	Other	Total
1977	$ 682,000	$1,566,000	$ 340,000	$ 17,000	$ 35,000	$ 79,000	$ 2,719,000
1978	1,250,000	1,566,000	622,000	44,000	94,000	107,000	3,683,000
1979	1,924,000	1,566,000	1,070,000	87,000	187,000	145,000	4,979,000
1980	2,237,000	1,566,000	1,794,000	152,000	340,000	183,000	6,272,000
1981	1,619,000	1,566,000	2,251,000	206,000	478,000	184,000	6,304,000
1982	1,852,000	1,944,000	3,168,000	281,000	677,000	238,000	8,160,000
1983	2,119,000	1,944,000	4,289,000	372,000	920,000	289,000	9,933,000
1984	2,424,000	1,944,000	5,620,000	461,000	1,209,000	350,000	12,008,000
1985	2,773,000	1,944,000	7,037,000	570,000	1,511,000	415,000	14,250,000
1986	3,173,000	1,944,000	8,933,000	689,000	1,912,000	500,000	17,151,000

Table 7-9. Estimated total annual costs for Configuration 1 - a National Periodical Resources Center - high growth rate

Year	Cost Element						
	Collection	Facilities	Staff	Photocopy	Communications and Delivery	Other	Total
1977	$ 682,000	$1,566,000	$ 378,000	$ 21,000	$ 44,000	$ 81,000	$ 2,772,000
1978	1,250,000	1,566,000	754,000	58,000	124,000	113,000	3,865,000
1979	1,924,000	1,566,000	1,459,000	126,000	283,000	161,000	5,519,000
1980	2,237,000	1,566,000	2,728,000	236,000	538,000	219,000	7,524,000
1981	1,619,000	1,566,000	4,089,000	380,000	868,000	256,000	8,778,000
1982	1,852,000	1,944,000	6,561,000	576,000	1,403,000	370,000	12,706,000
1983	2,119,000	1,944,000	8,966,000	770,000	1,921,000	472,000	16,192,000
1984	2,424,000	1,944,000	12,163,000	995,000	2,611,000	589,000	20,226,000
1985	2,773,000	1,944,000	16,141,000	1,311,000	3,465,000	769,000	26,403,000
1986	3,173,000	1,944,000	21,366,000	1,653,000	4,575,000	981,000	33,692,000

rate. The overall national system would expect the same demand as shown, but for years 1982 and subsequently, certain demand must be allocated to the three new regional centers. For the year 1982, the number of requests for the 3,000 heavily used titles with 1981 dates is required since this represents the demand eligible for shift to the regional centers. The 3,000 titles imply 75 percent of the total demand and one year of back issues should satisfy 10 percent of the total demand. Therefore, the combination is expected to satisfy about 7-1/2 percent of the total actual demand. Table 7-4 indicates an estimated potential demand of 2,040,000 satisfied requests in 1982, hence, about 153,000 of these requests would be for the 1981 issues of the 3,000 heavily used titles. The national center, as one of the four regional collections would retain 25 percent of the 153,000 requests with each of the other three satellite centers satisfying 25 percent of the requests also.

Using this rationale, the estimated demand for Configuration 2 is shown in Table 7-10 for 1982-1986. In practice the demand could not be divided evenly among the regions, but for design purposes the assumption is reasonable.

Table 7-10. Estimated actual demand for Configuration 2

Year	National Center	Regions			Total
		2	3	4	
1982	1,926,000	38,000	38,000	38,000	2,040,000
1983	2,354,000	99,000	99,000	99,000	2,651,000
1984	2,847,000	193,000	193,000	193,000	3,426,000
1985	3,357,000	325,000	325,000	325,000	4,332,000
1986	4,109,000	451,000	451,000	451,000	5,462,000

7.4.1 Collection Cost

The satellite centers will acquire the 1981-1986 issues of the 3,000 most heavily used titles. Using the average subscription prices presented in Table 7-2, the estimated collection costs for a single regional center (other than the national center) are as follows:

1981	$ 91,000
1982	$100,000
1983	$110,000
1984	$121,000
1985	$133,000
1986	$146,000

Collection costs for the national center would be the same as developed under Configuration 1.

7.4.2 Facilities Cost

The three new satellite centers would require the same kind of space as the national center. A ten-year span of 3,000 titles would contain about 150,000 volumes. At 10 volumes per square foot, 15,000 square feet of storage space would be needed. Another 10,000 square feet would be required for the service area for a total of 25,000 square feet. Assuming $5.40 per square foot, the annual lease cost is $135,000. In 1981 prior to opening for service, the space would be occupied for only about three months for an estimated cost of $34,000.

7.4.3 Staff Cost

The same set of assumptions as used in Configuration 1 will be applied again. The working rule -- one staff person for

each 5,000 requests satisfied -- would yield the staff size and cost for each regional center are shown in Table 7-11. Staff cost incurred in 1981 in preparation for services in 1982 is estimated at $33,000.

Table 7-11. Estimated staff size and cost for a single satellite center

Year	Staff Size	Staff Cost
1982	8	$ 129,000
1983	20	338,000
1984	39	691,000
1985	65	1,210,000
1986	91	1,779,000

7.4.4 Photocopy Cost

The photocopy costs for a single satellite center with the estimated demand given in Table 7-10 would be:

1982	$ 13,000
1983	$ 35,000
1984	$ 65,000
1985	$112,000
1986	$155,000

These costs assume all requests are satisfied by photocopy.

7.4.5 Communication and Delivery Costs

Telephone and telex costs for a single satellite center were computed under the same assumptions as for Configuration 1 and

are presented in Table 7-12. Postage costs in Table 7-12 assume that all requests are satisfied by photocopies delivered by First Class mail.

Table 7-12. Estimated annual costs for communications and delivery for a single satellite center

Year	Telephone	Telex	Postage	Total
1982	$1,000	$ 3,000	$ 20,100	$ 24,100
1983	1,600	4,900	55,400	61,900
1984	3,300	9,000	113,900	126,200
1985	5,800	13,900	201,500	221,200
1986	8,500	19,600	293,200	321,300

7.4.6 Other Costs

As in the case of Configuration 1, other costs should contribute another three percent of the total costs for collection, facilities, staff, photocopy, and communication and delivery.

7.4.7 Estimated Total Annual Costs for Configuration 2

The estimated costs for years 1975-1981 for the national center are identical to those shown in Table 7-9 for Configuration 1 under the high growth rate assumption. Commencing with 1982, the estimated costs would differ from those in Configuration 1 due to the shift in demand away from the national center (Table 7-13).

Table 7-13. Estimated total annual costs for the national center under Configuration 2

Year	Cost Element						
	Collection	Facilities	Staff	Photocopy	Communications and Delivery	Other	Total
1982	$1,852,000	$1,944,000	$ 6,192,000	$ 545,000	$1,323,000	$356,000	$12,212,000
1983	2,119,000	1,944,000	7,953,000	685,000	1,705,000	432,000	14,838,000
1984	2,424,000	1,944,000	10,090,000	827,000	2,169,000	523,000	17,977,000
1985	2,773,000	1,944,000	12,492,000	1,017,000	2,684,000	627,000	21,537,000
1986	3,173,000	1,944,000	16,068,000	1,242,000	3,440,000	776,000	26,643,000

Table 7-14 presents the estimated total annual costs for a single satellite center. The costs in Table 7-14 do not include the 1981 expenses of each satellite center as follows:

Collection	$ 91,000
Facility	34,000
Staff	33,000
Other	1,000
Total	$159,000

To arrive at the total estimated costs for Configuration 2 (less 1981 expenses), multiply the re[illegible] center costs (Table 7-14) by a factor of 3 and add the figures for the national center (Table 7-13) for the following:

1982	$13,448,000
1983	$16,938,000
1984	$21,463,000
1985	$27,132,000
1986	$34,479,000

In comparing the estimated total costs for Configuration 2 with those for Configuration 1 (Table 7-9), the annual difference is quite small. Staff, photocopy and other costs are somewhat larger for Configuration 2, whereas, postage cost is less. The difference in the postage cost is due to the assumption that all requests are satisfied by photocopy at the satellite centers. Consequently, less original items are loaned under Configuration 2, resulting in less postage.

The small collections located at the three regional centers could easily be put into microforms. Less space would be required and overall costs should be reduced. With the fast-changing technology in the microform field, we have been reluctant to speculate on costs that far into the future.

Table 7-14. Estimated total annual costs for a single satellite center under Configuration 2

Year	Cost Element						
	Collection	Facilities	Staff	Photocopy	Communications and Delivery	Other	Total
1982	$100,000	$135,000	$ 129,000	$ 13,000	$ 24,000	$12,000	$ 412,000
1983	110,000	135,000	338,000	35,000	62,000	20,000	700,000
1984	121,000	135,000	691,000	65,000	126,000	34,000	1,162,000
1985	133,000	135,000	1,210,000	112,000	221,000	54,000	1,865,000
1986	146,000	135,000	1,779,000	155,000	321,000	76,000	2,612,000

7.5 Configuration 3 - A Regional Resource Network

The final alternative configuration to be treated is that of a regional system of periodical resource centers based on the use of existing collections in libraries. Such an operation would commence with the invitation for libraries with exceptionally strong periodical collections to express an interest in serving as regional resource centers for the supply of periodical materials. Dependent upon the number and strength of the interested libraries, the country would be divided into nonoverlapping regions.

Of the three configurations, this one is the most difficult to cost. It is assumed that contracts would be signed between the national organization and individual regional libraries in a manner similar to NLM's Regional Medical Library Program. This approach assumes the creation of a national organization to coordinate a national network. The central authority would consist of a small planning and coordinating staff with all services being provided by the contract libraries. In contrast to the previous two configurations, a national center with its own collection would not be developed. Backup to the regional libraries would be provided by other existing collections, e.g., CRL.

Before we can speculate on system costs, an estimate of the expected demand is needed. Earlier in Table 7-1, the potential demand for periodicals at the national level was displayed. In 1977, the estimated demand was 613,000 requests under the low growth rate and 790,000 requests assuming the high growth rate. Regional centers, based on existing collections, should be able to satisfy a greater proportion of the potential demand in the earlier years than either of the previous two configurations.

We have assumed that a single regional center would not exceed actual demand of about 200,000 annual requests. Based within an existing library, a larger operation than this does not seem realistic for most institutions. The University of Minnesota interlibrary loan operation, MINITEX, is expected to handle about 100,000 loans this year, and has few problems meeting that demand.

We would not expect a regional library to start with 200,000 annual requests. A more realistic schedule is as follows:

1977	25,000
1978	50,000
1979	75,000
1980	100,000
1981	125,000
1982	150,000
1983	175,000
1984	200,000
1985	200,000
1986	200,000

An attempt would be made to keep a regional library below 200,000 filled requests by adding either additional regional libraries or national backup libraries, such as Library of Congress and Center for Research Libraries. Ten regional libraries filling up to 200,000 requests each would be able to handle the estimated potential demand through about 1982 under the low growth rate and through about 1980 under the high growth rate.

At 25,000 filled requests in the initial year, the estimated costs for a single regional library are as follows:

Collection Development	$126,000
Lending Service Contract	122,000
Total	$248,000

The above costs assume the contract library would be reirbursed for purchase of 3,000 heavily used titles and the preparation of the issues for filling requests. In 1977 the collection cost is $62,000 for 3,000 titles, $6,200 for binding, and staff cost of $58,000. Staff cost includes six persons at $9,700 annual salary and benefits for ordering, check-in, and shelving of the literature. The contract for lending service within the regional center is based on a unit cost of $4.86 for each filled request. This unit cost may appear low in comparison to traditional interlibrary loan costs, but we are assuming an efficient operation devoted to filling loan requests. The $4.86 was developed by inflating a 1973 figure of $4.00 by five percent annually. A unit cost of $4.00 per filled request is in-line with NLM's payment to regional libraries and should cover direct costs and some overhead. The amount also appears adequate based on rough cost estimates for dedicated services such as MINITEX.

The estimated total annual costs for a single regional library in subsequent years can be computed using the above assumptions. Annual subscription prices were given in Table 7-2. Applying these prices for 3,000 titles and adding 10 percent binding costs, yields the annual costs for the materials. It is assumed that six staff would be needed for the preparation of the literature. These salaries were inflated five percent per year commencing with $9,700 annual salary in 1977. The unit costs of $4.86 for 1977 was inflated at five percent annually to arrive at the contract price per filled request. Estimated total annual costs for a regional resource library are shown in Table 7-15.

For a national network of ten regional resource libraries, the annual total costs in Table 7-15 would be multiplied by a factor of ten for estimates of annual system costs.

Table 7-15. Estimated total annual costs for a single regional library under Configuration 3

Year	Collection Development	Lending Service Contract	Total
1977	$126,000	$ 122,000	$ 248,000
1978	137,000	255,000	392,000
1979	147,000	402,000	549,000
1980	158,000	563,000	721,000
1981	171,000	739,000	910,000
1982	184,000	932,000	1,116,000
1983	199,000	1,141,000	1,340,000
1984	215,000	1,370,000	1,585,000
1985	232,000	1,438,000	1,670,000
1986	252,000	1,510,000	1,762,000

8. COMPARISON OF CONFIGURATIONS AND RECOMMENDATIONS

Three alternative configurations of a national periodical resources system have been investigated and discussed in the two previous chapters. The intent of this chapter is to compare the alternatives on a basis that will lead to selection of a recommended national system for improving the availability of periodical materials to users.

8.1 Cost-Effectiveness

Most economic analyses of proposed large systems include or consist of a cost-effectiveness study. Cost-effectiveness or cost-performance analysis refers to the case where benefits are expressible only in terms of effectiveness in contrast to benefit-cost analysis, where benefits and costs are expressed in common monetary units.

In comparing alternative systems, each system should fulfill the basic set of objectives. Systems seldom do this in identical ways, consequently, analysis is generally needed to insure reasonable comparisons. Two common selection criteria used in economic analysis of alternative systems are: (1) for a fixed level of cost, select the system that maximizes effectiveness, and (2) at a fixed level of effectiveness, select the system that minimizes cost. For our purposes, we will try to equate costs of the configurations and compare the effectiveness. A recent project[1]

[1] Elton, M. C. J., and Orr, R. H., Document Delivery Service in a Hierarchical System of Libraries. London: University College London, 1973. (CSG Report P/73303/EL to OSTI).

by Elton and Orr considers in much greater detail mathematical models of the effectiveness and costs of document delivery in a two-level system of libraries. Their report was available only during the final weeks of this study and time did not permit consideration of their proposed methodology. Based on a brief review, the work by Elton and Orr should lead to a better understanding of the economics of local library service versus the service provided by a hierarchical system of libraries.

The three alternative configurations presented in Chapters 6 and 7 can be reduced to two alternatives for comparative purposes. Configuration 2, a satellite system of small dedicated collections with a comprehensive national center, is really just an extension of Configuration 1, a single national center. Early development of both alternatives is identical with several new satellite centers being established in about the fifth year of operation under Configuration 2. The ten year cost of Configuration 2 is slightly greater than the cost of Configuration 1 over the same planning period assuming the high growth rate in demand. And, the effectiveness is roughly equivalent; it is identical for five years and then with the introduction of the regional collections, it might improve some due to faster delivery service. Such an improvement in delivery time would only involve a savings of one day on the average. Configuration 2 was considered as an alternative only under the high growth rate for demand. The low growth rate seems more in line with the expected demand upon a national system in the U.S., and Configuration 2 would only be considered if, in fact, the demand grew at a faster rate. With these comments, we will proceed to compare Configurations 1 and 3.

For comparative purposes, it is assumed the Configuration 3 would consist of ten regional resource libraries. Each library would receive funds to acquire the 3,000 most heavily

used titles. In Chapter 7 annual demand was assumed to start at about 25,000 requests, and increase annually by an additional 25,000 requests up to 200,000 requests for each center. Table 8-1 compares the total potential national demand to that satisfied by each of the two configurations. The estimated demand assumes the low growth rate.

Table 8-1. Comparison of satisfied demand for each configuration to the total potential demand

Year	Potential National Demand	Satisfied Demand	
		Configuration 1	Configuration 3
1977	613,000	58,000	250,000
1978	821,000	158,000	500,000
1979	1,060,000	308,000	750,000
1980	1,367,000	541,000	1,000,000
1981	1,668,000	734,000	1,250,000
1982	2,051,000	984,000	1,500,000
1983	2,441,000	1,269,000	1,750,000
1984	2,831,000	1,585,000	2,000,000
1985	3,200,000	1,888,000	2,000,000
1986	3,680,000	2,281,000	2,000,000

Due to the depth of the back issues of many titles in the contract libraries, in addition to the 3,000 most heavily used dedicated titles, Configuration 3 performs better in the earlier years. As the back files grow in Configuration 1, the single National Periodical Resources Center begins to compare well in the later years.

The estimated annual costs and unit costs for the two configurations are shown in Table 8-2. Unit costs were computed by dividing the estimated total annual cost by the number of satisfied requests (Table 8-1) each year.

Table 8-2. Comparison of estimated total costs and unit costs

Year	Configuration 1		Configuration 3	
	Total Cost	Unit Cost	Total Cost	Unit Cost
1977	$ 2,719,000	$46.87	$ 2,480,000	$9.92
1978	3,683,000	23.31	3,920,000	7.84
1979	4,979,000	16.17	5,490,000	7.32
1980	6,272,000	11.59	7,210,000	7.21
1981	6,304,000	8.59	9,100,000	7.28
1982	8,160,000	8.29	11,160,000	7.44
1983	9,933,000	7.83	13,400,000	7.66
1984	12,008,000	7.58	15,850,000	7.93
1985	14,250,000	7.55	16,700,000	8.35
1986	17,151,000	7.52	17,620,000	8.81

The unit costs behave in an expected manner for the two systems. Configuration 1 has higher fixed costs in the earlier development years which increase the corresponding unit costs. As satisfied demand increases due to the expanded collection, the unit costs continue to drop. A similar, but less dramatic effect, is in play in the early years of Configuration 3. But due to the imposed constraint on the growth of demand, the unit costs hit a minimum and then begin to increase. This is a problem in most operations where the demand slows and eventually remains constant. Annual costs continue to inflate and being spread over a constant demand force unit costs up.

The results displayed in Table 8-2 reveal a typical problem in comparing alternative systems. One alternative appears better on a unit-cost basis for the early stages, and then the second alternative becomes the most attractive in the latter part of the planning period. If we consider the full ten year costs plus the pre-opening date costs and satisfied demand, Configuration 1 satisfies 9,806,000 requests at $86,650,000 for a unit cost of $8.83 per request. The total cost for Configuration 3 is

$102,930,000 and satisfies 13,000,000 requests for a unit cost of $7.92. In order to say approximately how much the two configurations differ, we can assume that the same cost was spent for Configuration 3 as Configuration 1, or $86,650,000, and compute the number of satisfied requests Configuration 3 would have satisfied. Dividing $7.92 into $86,650,000 gives 10,940,000 expected requests under such an assumption. Comparing this number of requests for Configuration 3 to the 9,806,000 requests satisfied by Configuration 1, at the same cost level, shows that Configuration 3 satisfies about 12 percent more requests than Configuration 1 over the ten years. One could conclude for the ten years that Configuration 3 is about 12 percent more effective than Configuration 1 at the same fixed cost. It should be obvious that this statement is reasonably valid only at that assumed cost level.

If we were comparing two systems that had useful lives of only ten years we would invest in Configuration 3 based on the above argument. The problem is that both configurations are designed to continue after the ten-year planning period. In fact, the level of satisfied demand (Table 8-1) and the unit costs (Table 8-2) indicate that Configuration 1 is improving in 1986, whereas, Configuration 3 has leveled-off in satisfied demand, and unit costs are increasing. Of course, Configuration 3 could be improved in the latter part of the planning period by either adding more regional libraries, introducing another level of contract libraries within each of the ten regions, or removing the demand constraint of 200,000 annual requests for each regional library.

Thus far in this discussion, Configuration 3 has been assumed to include ten regional libraries contracting with a national agency to provide the lending services. No costs have been assumed for backup services or development of bibliographic data files for identification and location of titles. In order to function as a national network, exchange capabilities between the

ten regional libraries would be necessary. Likewise, network management must exist. Although we have not developed cost estimates or specifications for bibliographic data files, the addition of these costs, telecommunications costs, and the annual salaries for network management would reduce the difference between Configuration 1 and Configuration 3. The inclusion of these costs should at least, reduce the effectiveness of Configuration 3 over Configuration 1 to less than 10 percent for the same assumed investment over ten years.

With the estimated difference between the two proposed alternative configurations being less than ten percent, it is difficult to choose one alternative over the other strictly on an economic basis. The cost estimates are not precise enough to state that such a small difference between the two configurations is significant. Factors other than cost should be taken into account.

8.2 Non-Cost Factors

In order to compare the two configurations, a National Periodical Resources Center and a Regional Resource Network, it is worthwhile to review the goals specified, in Chapter 5, for any national plan designed to improve the access to periodical materials. The goals were stated as follows:

1. Improved access to periodical materials to all users.
2. Improved delivery of periodical materials.
3. Reduced burden on large net lenders of periodical materials.
4. More effective utilization of individual library funds in the provision of periodical materials.

Both alternatives meet the goals, but not necessarily to the same degree.

For the first goal, improved access to all users, the two should be similar except for the most sophisticated research requests. A single national center with all worthwhile journal titles appears to offer a better source for the sophisticated requests. Although the collections of the regional resource libraries under Configuration 3 would be relatively strong, their overall strength would not equal the NPRC.

The Regional Resource Network might be able to deliver items in less time (the second goal) than a single center where mail delivery is involved. Assuming the same internal processing times, the reduced distances in the regional system could allow for somewhat faster delivery. We estimated the difference in average delivery times to be about one day. The question is then what is the value of one day saved in the total time span from submitting the request at the borrowing library to receipt of material.

Both configurations should remove the present burden on the large net lenders in the existing interlibrary system as called for in the third goal. Some or all of the regional libraries in the Regional Resource Network would probably be large net lenders in the present system, but would be receiving compensation for their services under the new plan.

Goal 4 is, perhaps, the most critical one in comparing the two configurations. The last several years have found libraries faced with tight budgets in light of spiraling costs. This problem is particularly acute for periodical materials. Budgets for monographs, in some cases, have been drastically reduced in order to continue subscriptions to periodicals.

Librarians are reluctant to cut subscriptions without a backup source where these dropped titles could be borrowed when needed. A single national center with a comprehensive collection should offer librarians the confidence required in a backup to their library collections. The Regional Resource Network would consist of existing libraries with strong collections, but since the system would depend on the decisions of independent institutions to continue their role as resource centers, it does not provide guaranteed access as in the case of the NPRC. The NPRC would allow librarians to better allocate their funds for current subscriptions, to reduce retrospective holdings and duplicate subscriptions, and to plan their total budget in a more realistic manner.

8.3 Recommendations

Based on the above discussion of factors other than cost, Configuration 1, a single new Center, appears to offer the best strategy for a national periodical resources system. A comprehensive collection at a national Center should better serve the library community in the long run. Development of an effective network of regional libraries without a comprehensive backup collection would require a large bibliographic data base with locations of titles for referral. Even with a location file, a major disadvantage depending on existing collections is the lack of standards for service. Physical access is by no means accomplished by knowing where the title desired is owned.

It is recommended that a single National Periodical Resources Center with a comprehensive collection be developed to improve access to the periodical literature. The key to the future development of such a national system is the availability of funding. Implementation of the recommended plan will be discussed in the next chapter.

9. IMPLEMENTATION

This is a time of change in libraries, and development of any new system or resource must not only be reviewed in the context of its present place in the total information environment, but its relevance to the patterns of the future.

What are the probable patterns of the future? How will, or can, the system conceptualized here fit into the present while looking ahead to the future?

Developing efforts appear to stress:

1. Improved access to information,
2. Improved delivery of information,
3. Elimination of barriers,
4. Sharing of resources,
5. Automation programs designed to effect these goals, as well as to make materials handling more efficient and cost-effective, and
6. Some level of standardization in materials control to make variant systems compatible.

Programs to effect these goals are underway in all parts of the country, but realists recognize that to maximize their effectiveness, some national coordination and development of supplementary resources is necessary. A draft paper released by the National Commission on Libraries and Information Science (NCLIS) in October 1973 notes that their program "...reflects the Commission's view that library and information services are a national knowledge resource to be sustained and integrated for

all citizens to use in the course of their personal and economic pursuits."[1]

Design criteria suggested earlier in Chapter 5 attempt to reflect these goals and aspirations as they are relevant to the mission of providing periodical materials. Elimination of barriers, sharing of resources, standardization of materials controls, and improved physical, intellectual, and knowledgeable access to information are all seen as realizable early goals.

Improved delivery of information, particularly in the advanced technological approach envisaged in the NCLIS goals, is a factor which must be relegated to the future, but planning now should make incorporation of such expected technological systems in the future logical and cost-effective.

9.1 Operational Implications

In designing the National Periodical Resources Center, the needs of several different groups must be considered and coordinated. Of greatest importance, of course, is the service to users of periodical materials, which provides the raison d'etre for a center. Implications of such a service on libraries currently providing access to periodical materials through interlibrary lending must also be deliberated, and certainly no such system as proposed can ignore the necessity for consideration of its relation to the total library community.

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[1] National Commission on Libraries and Information Science, A New National Program of Library and Information Service (Draft), October 1973.

9.1.1 Service to Users

Design of the NPRC is predicated on a study of current user needs and use patterns, but it also provides for continuous monitoring to maintain a constant awareness of and relevance to changing or developing needs.

Although initially the Center may be expected to improve only physical access to periodical materials, this improvement should be significant. The elimination of collection gaps as identified, resulting in greater overall materials availability, the simplicity of single entry-point access, and the greater speed of access, should all contribute.

Finally, a user-oriented service, accepting full responsibility for coordination on a national basis of all aspects of periodical access and delivery, as well as education of users and librarians in use of the system and its materials, should be the first step towards increasing and equalizing information availability to all users.

9.1.2 Impact on Libraries

As noted in earlier chapters, requests for periodical materials through interlibrary loan represent almost half of the total demand on academic libraries. Demands on some of these libraries, rich in resources, which provide a substantial proportion of all interlibrary lending have become burdensome, both in cost of service and in demands on the local collection. For borrowing libraries the ILL system has also provided a less than optimal solution to material needs, since materials are frequently difficult to locate or unavailable at a number of locations, and time delays in access and delivery have been substantial.

Development of a national system is frankly designed, in time, to supplant a very large proportion of ILL service in the periodicals area, thus reducing the burden on heavy lenders and providing improved service to the borrower. But this is not considered the sole impact on libraries of a periodicals center.

Gordon Williams, Center for Research Libraries, has defined little used materials as those which are cheaper to borrow than to own. Yet without guaranteed access to these little used materials, librarians have been reluctant to depend on borrowing. Developing a central resource with a comprehensive collection including all little used periodicals, and making its services available to all users, permits such rational decisions in terms of local necessities since a dependable source of materials not collected locally is assured.

9.1.3 Communications

An important thrust of the Center must be in the area of communications. We have discussed the NPRC as an extension of the local library, capable of promptly supplying supplementary periodical materials and services. Speed of service is essential to this mission, and this requires development of direct, simple, and inexpensive communications between the Center and the libraries it serves. Librarians have noted the need for cheaper forms of communications networks; research efforts of the Center must include maintaining a continuing review of new, improved, and less expensive methods of communication, which should be implemented as rapidly as feasible. Most important in establishment of initial channels of communications is maintaining the flexibility which will permit such changes when they are viable.

9.1.4 The Role of the NPRC in Pelation to Present Interlibrary Loan Patterns

As noted above, the establishment of the National Periodical Resources Center aims at eventually supplanting the ILL function with regard to most periodical materials. Does this approach offer any threat to established patterns of interlibrary lending or cooperation?

Arguments for development of the Center as an alternative to the costly, burdensome, and generally inefficient current lending patterns have been made in Chapter 5, Section 5.1. Although change in present patterns of lending will undoubtedly be gradual, it does not appear rational to feel that any individual library would feel threatened by diversion of a load which many are becoming increasingly reluctant to carry. Ninety-seven percent of the directors of academic libraries surveyed (see Appendix A) have reported that they are willing to support establishment of a national Center financially, by supply of materials, or both. It would appear that librarians view the Center as a viable method for extending their own service to local users.

As capabilities for meeting total needs locally diminish, the pressure for national solutions to the problems of providing unlimited access to information resources for an ever-growing number of ever-more sophisticated users has increased. The national Center seeks to meet that demand.

9.2 Sponsorship of an NPRC

The question of possible operating agencies for an NPRC is closely linked to the major mission of the Center and its projected population of users. Given the stated purpose of providing

periodical materials and associated services to all users and all types of libraries, the principal requirements for sponsorship must include:

1. A truly national concern and perspective, and a commitment to satisfying the information needs of all types of users.
2. The ability to relate to all segments of the information environment (social, political, organizational).
3. Confidence of the library community.
4. Access to funding sources.
5. The leadership capability to initiate and see through the funding and organization of an NPRC.
6. Willingness to undertake development.

The existing collection, central geographic location, experience, freedom of first responsibility to a local group of readers, and broad national base of support from and service to all types of libraries -- university, public, government, and special -- suggest the Center for Research Libraries (CRL) as a logical agency for developing the envisioned center. The CRL is a nonprofit, tax exempt, educational institution established, operated, and supported by over 70 of the major universities and public research libraries in the United States and Canada, plus nearly 60 smaller colleges, government, and industrial libraries, and the number of supporting members and associate member institutions is increasing steadily. Membership and CRL service is national in scope, covering the entire geographic United States and Canada. Although priority of service is given to supporting member libraries, the CRL policy and practice provides for loan to any library, whether a member or not, and it in fact now annually provides several thousand such free loans to several

hundred non-member libraries. Such limitations as are imposed on loans to non-member libraries are entirely the result of the fact the Center is not tax supported but presently must look solely to its members for financial support.

The CRL was established in 1949 essentially to be a "libraries' library" for the collection of infrequently used library research materials in all subject fields and in all forms -- periodicals, books, newspapers, documents, and microforms -- and their loan to member libraries. It built and occupies its own building especially designed for the compact housing of library materials, and owns enough land to provide for more than quadrupling its present building capacities. Its collections now number well over three million volumes, counting both books and serials, in all fields. However, most of the serials are in the fields of the physical, biological, and social sciences with fewer in the humanities.

In addition to CRL several other organizations should be considered. The active role of the Association of Research Libraries in developing the concepts and design of a National Periodical Resources Center suggests the ARL as a likely initial sponsor for developing the envisioned center. Should the broad applications of proposed services to all types of users and libraries be incompatible with ARL's identification with more limited categories of libraries and users, the Library of Congress or the American Library Association provide logical alternatives.

Willingness to undertake the development of a National Periodical Resources Center, as well as leadership capability for doing so, must be the critical determinant in choosing the sponsor.

9.3 Funding the NPRC

Three types of funding are necessary for implementation of a Periodicals Center: initial or "seed" money to start up the Center, sustained funding for collection development, and operational funding for performing the scheduled services. A number of possible methods for financing these needs should be explored, but it is important to recognize at the outset that successful implementation will require a sound, stable, and dependable financial base.

For a national program of this scope some level of federal support would appear to be almost mandatory, and certainly such federal support would be in the national interest of assuring ready access to information by all segments of the population for the development and maintenance of U.S. research and education, and the application of knowledge to national needs. Libraries themselves, already inadequately funded, cannot reasonably be expected to fully support such a program. The fact that the program is needed to provide them with access to what they cannot already supply from their own collections is proof enough of this. A program would undoubtedly permit a more economic development of individual library collections. The best use of such savings would most probably be their retention by the individual local libraries to help them to meet their inevitably increasing expenses for bibliographic access to an enlarging corpus of knowledge and similar needed services. However, at least some partial contribution by individual libraries to the national program is at least a possibility that might be considered.

The present policies and funding of the National Science Foundation, National Endowment for the Humanities, and Office of

Education, do not, as nearly as we can tell, permit them permanently to fund this program on a regular and continuing basis. They might, though, be looked to for help in funding research and development of secondary services and new techniques.

9.3.1 Development of the Center as an Independent Federal Agency

Before the NPRC could reasonably be established within the federal government, a more basic decision is needed on the creation of a federal organization invested with the authority and responsibility for planning and implementing national library policy. Whether such a central authority should be an independent government agency or a quasi-governmental organization similar, perhaps, to the U.S. Postal Service and the Corporation for Public Broadcasting, requires investigation. Developing the Center as some kind of a national agency deriving basic support from federal funding would undoubtedly provide the optimal stability for a national service operation. The Library of Congress, the Smithsonian Institution, and the National Technical Information Service establish precedent for this type of support, and certainly the described mission of the Center is in full compatibility with other federal programs of national service and development of national resources. Provision of this service independent of the Library of Congress can certainly be justified as inherently incompatible with the present LC archival role, although obviously a large measure of cooperation and coordination with the Library's MARC (Machine Readable Cataloging) Serials Program and the NSDP (National Serials Data Program) in any future development of a bibliographic data file would be both necessary and highly desirable.

There are, of course, some problems inherent in governmental funding. The annual budgeting cycle provides periodic threats to levels of service and introduction of new services. The charter of the Agency should thus incorporate the capacity for utilizing both internal revenues and such other funding (grants or subsidies, gifts, etc.) as it may develop. Special collections and special services may well be funded by specific interest groups whose needs are better met by their availability, and certain innovative programs may be introduced with the support of interested philanthropic groups. Cooperation from such potential benefactors should be actively solicited as needs and programs are developed.

Operation of the Center as a federal agency would probably carry with it the necessity for at least a nominal charge for materials provided. This charge, or transaction fee, could be collected in a variety of ways: deposit accounts or prepayment (NTIS and ERIC offer examples), a quarterly computer billing system, a credit card system, or a coupon system similar in operation to that utilized by the British Library.[2]

State library networks might arrange to pay for total or partial costs of such transaction fees, or contract for a blanket charge for unlimited service for all users from the state. The state "blanket" fee or partial support fee would not be incompatible with any other charge system utilized for libraries in states which did not elect any form of state support for the service, or for libraries not covered by the state support contract as negotiated.

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[2] A full discussion of some methods for collecting such fees may be found in Palmour, Vernon E., Olson, Edwin E., and Roderer, Nancy K. Methods of Financing Interlibrary Loan Services, Washington, D.C.: Association of Research Libraries, February 1974.

International access to materials in the Center might also be expected to generate additional revenue. Some of this revenue might be collected in the form of a transaction fee (the British Library Lending Division utilizes a special international user coupon for this purpose), but it might well be possible to provide contract service to particularly heavy users. Canadian libraries have long participated in cooperative undertakings with American libraries and currently pay participation fees to such agencies as the Pacific Northwest Bibliographic Center. It would be reasonable to explore such avenues of participation for any interested group outside the United States.

9.3.2 Cooperative Federal-State Funding

Another possible method of financing would be establishment of an independent, nonprofit corporation, funded by the federal government with matching funds from the individual states. State counterpart fund levels might be simply determined by a per resident charge, or by more complicated formulas introducing such elements as volume of total resources in the state, level of use for previous year, etc. Large resources breed heavy demand, but unmet need may also be expected to create increasing demand. For this reason, the simpler formula for matching on a per resident basis for state governments might well prove more equitable in the long run.

Establishment of such an independent, nonprofit corporation, sustained by a fixed support contribution, would have certain advantages in providing predictable fiscal resource levels on which to base service levels and introduction of new services, as well as collection development. It should not preclude special

grants or subsidies from foundation, industry, or other donors for special purposes, programs, or innovations in development, which again should be actively solicited.

A particular advantage to this type of federal-state support is its inherent capability for the provision of the best possible access to periodical materials for all users, since it interposes no barriers of service charges. Admitting a service charge element into any service system provides an automatic, though unwanted, barrier to full access, since individual libraries or library systems which assimilate these costs tend to restrict the categories of users to whom the service is made available, or the materials which may be acquired. Where service charges are passed on to users such barriers may be self-imposed but tend effectively to deny needed information to categories of users for whom it could be most valuable.

Unfortunately, the advantage of full state cooperation is seriously overshadowed by the problems of achieving it. It is unlikely that such cooperation would be automatic or prompt. It would seem feasible, however, to determine which of the states would be willing to cooperate in such a venture with an early starting date. With federal funding on the agreed level, counterpart funding from cooperating states under an interstate compact, and possibly some seed money grants from foundations or other sources, operations of the Center could be inaugurated. Full service would be available to all libraries in the cooperating states; membership fees, contract fees, or transaction fees could be utilized for provision of services to libraries in the noncooperating states. Additional states could be admitted to the Center as they chose to join.

9.3.3 Funding Through Membership and Service Fees

As noted earlier, 97 percent of the library directors queried in the survey, discussed in Appendix A, expressed willingness to support the establishment of a periodical resources center. Seventy-six percent of these directors were willing to pay a membership fee for such services. The establishment of a nonprofit corporation, with funding based on a membership fee for those libraries subscribing to the service and cost-recovery transaction fees for all other users, would appear to provide a possible alternative. Unhappily the track record of such cooperative ventures has not been good. Individual libraries take second looks at budgetary allocations, and the projected panacea which starts out with enthusiastic cooperation is seldom given the support or time to prove itself. Such activities which survive are frequently underfinanced, with continued viability too often dependent upon the dedicated efforts of a strong leadership rather than a strong systems development.

This is not to say that establishment of a self-supporting organization with such initial funding background does not provide a possible early beginning with a more stable permanent financing formula to be developed as the Center proves its value to state and federal funding agencies. The WILS system in Wisconsin is beginning its second year of operation with membership support plus a contract fee from the state for support of public library use, but this method of financing is considered a temporary expedient until full state support can be secured. The MINITEX operation in Minnesota also began with temporary support, in that case from a foundation, but is now entirely financed by the state.

Foundation grants or temporary subsidies might well be secured to aid in establishing a national service. Although the membership-foundation approach to initiating the Center may well be the means for "getting it off the ground," serious consideration must be given to more stable financing if the project is to develop properly and remain viable.

9.3.4 The NPRC as a Contract Service

One other method of financing a periodicals center should be considered. This is the possibility for development of a photocopy supply service for periodical materials which would operate on a commercial basis. Fees could be based on contracts or individual transactions, but would necessarily be at a level which could provide for full cost recovery.

Operated by a nonprofit organization, such a method could provide delivery of a limited service. Since it would require cost recovery, it could not effectively provide little used materials but would necessarily be focused only on those materials for which volume of demand made their collection cost-effective. The auxiliary services, e.g., referrals, of the proposed Center, designed to increase access, are not income-producing services and could not be supported.

The cost to the user involved in this type of service would not only limit access to materials, but might well be detrimental to the service in the long run. Certainly it is unlikely that it could meet Center objectives of improved availability of materials to all users.

9.4 Management of the NPRC

Characteristics of organizational design will depend to some extent upon the sponsor of the Center. The following sections suggest general guidelines for the organization, management, and staffing of the NPRC.

9.4.1 Governance

A Board of Directors should be established to decide broad policies and timetables for implementation as well as act as advisors to Center operations. This Board of Directors should include representation from a wide variety of interest groups, e.g., users-spanning the range from the general public to scholarly researchers -- all types of libraries-academic, public, government and special -- related institutions and organizations-educational, industry, and professional societies.

Standing committees of the Board should not only monitor operational performance and fiscal stability of the Center, but should deal with such areas as research and technology, coordination of activities of divergent groups, standards, educational programs, and promotion of the Center.

9.4.2 Administration

Operational control of the Center should be invested in a Director carefully chosen to encompass as many as possible of the following qualities:

1. Demonstrated qualities of leadership and initiative.
2. Proven administrative capabilities.

3. User orientation.

4. Experience in delivery of information, materials, and services.

5. Experience in library cooperation, preferably among libraries of different types.

6. Familiarity with technological developments in accessing and/or delivering information.

7. Receptivity to alternative methodologies and willingness to test and exploit them.

Functions of the Center should be divided into three categories with an Assistant Director of proven capability in the area heading each category. These divisions and their subfunctions are:

1. Housekeeping Functions

   a. Administration
      General Administration
      Physical Plant and Maintenance

   b. Fiscal Control
      Budgets
      Disbursement

   c. Personnel and Training
      Employment
      Personnel Contact
      Staff Training

2. Operational Functions

   a. Operations
      Technical Support
      Selection and Acquisition of Materials
      Materials Processing
      Requests Processing

   b. Bibliographic Operations
      Technical Support

3. Supportive Functions

   a. Research and Technology
      - Systems Analysis and Evaluation
      - Design of New and Special Services

   b. Educational Programs
      - Design and Evaluation
      - Presentation of Workshops
      - Development of Materials

   c. Communications
      - Communications Systems
      - Delivery Systems

Two other functions of importance should be noted:

1. Coordination with Exterior Systems
   - Publishers and Other Information Industry Services
   - Other Collections
   - Other Library Systems

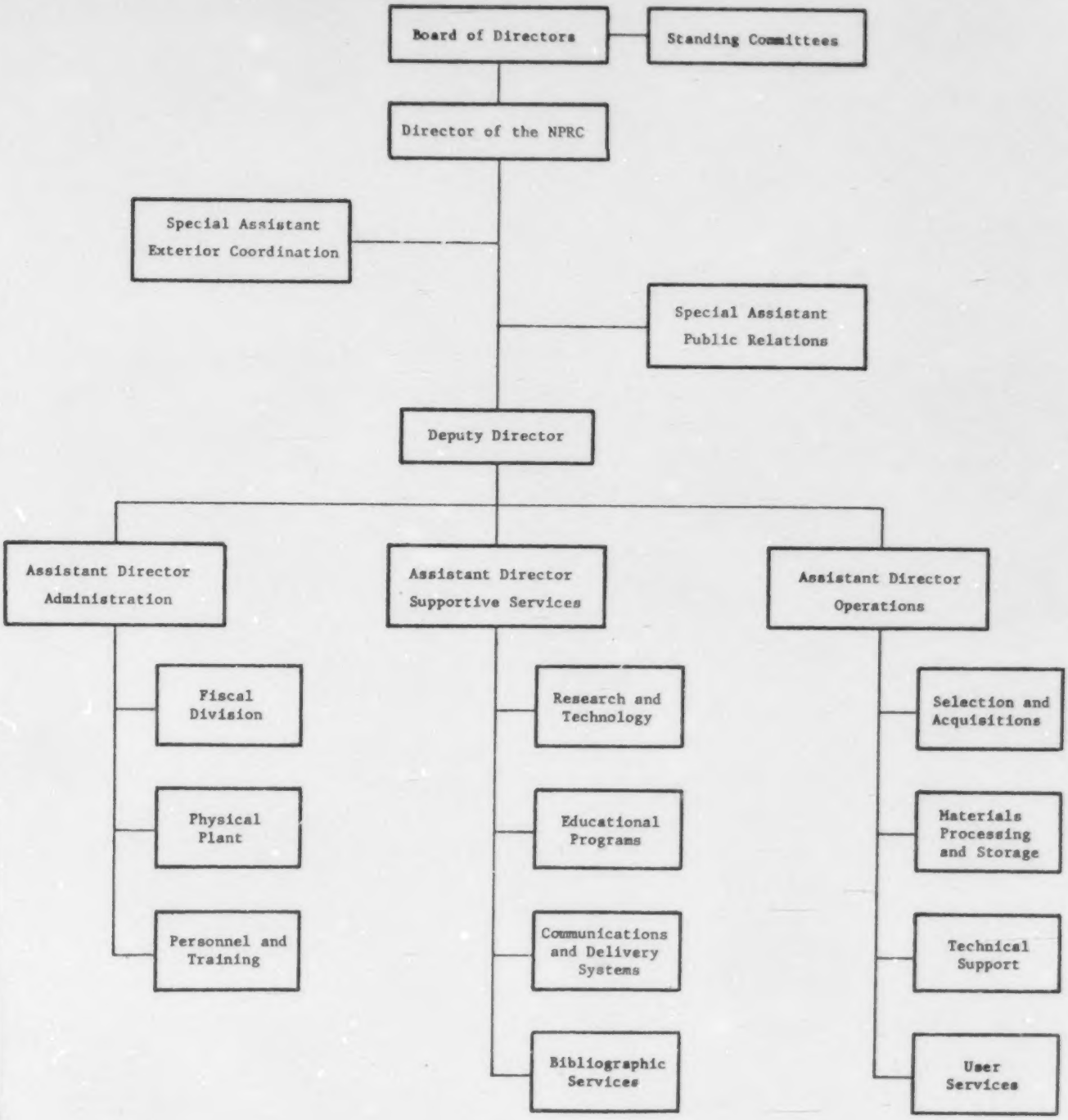
2. Public Relations
   - Promoting the Center

Figure 9-1 outlines the proposed organization and control for the NPRC.

9.4.3 Staffing the Center

Establishing a facility pertinent to users needs for information from periodical literature requires more than the development of a comprehensive collection and an efficient delivery system. The Center must also have a stable, well-trained staff capable of providing the desired level of service. To achieve this, personnel staffing the Center must not only be trained for specific tasks, but must be thoroughly educated in the mission and functions of the total system. Substantial effort should be made

Figure 9-1. Organization and control of the NPRC



to utilize the expertise developed to innovate and improve services. Feedback to staff must identify strengths and weaknesses, and pinpoint areas requiring improved techniques or performance.

Rotation of personnel in semi-skilled activities to relieve boredom, and establishment of procedures and training for upgrading employees in the system, should be undertaken to limit as much as possible the turnover of personnel at the Center.

9.5 Next Steps

A feasibility of design study which is filed on a shelf has no value. If the concept and design are viable, certain steps should be taken to implement them. These "next steps," in the case of an NPRC, include:

Finding a sponsor
Selecting the Director
Developing funding resources
Promoting the Center

9.5.1 Finding a Sponsor

As originator of this study, the Association of Research Libraries should take responsibility for evaluating the design and configurations presented and initiating the necessary steps for implementation of the configuration selected. First step in implementation is selection of sponsors or a sponsoring agency willing to undertake development of a national resource and capable of providing the dedication and knowledge required for carrying it through. One of the first tasks of this sponsor should be selection of a Director for the Center.

9.5.2 Selecting the Director

Of all the dimensions of the problem of developing an NPRC for the U.S. we have discussed, none is more vital than the dimension of leadership: the dynamic, driving effort of a single entrepreneur or the intense dedication of a small group. Zeal, a large measure of self-confidence, an ability to handle conflict, to be persuasive, to be trusted, to creatively solve problems, to be aware of and responsive to key elements in the environment are some of the most important attributes of a person selected to direct the Center. The establishment of the NLL in Great Britain provides a good example of how one person with the responsibility and authority drove towards the goal of a national center until he and the NLL succeeded beyond all early expectations.

Selection of such a person, charged with the mission to develop the NPRC, should be expedited. General guidelines for development should be established by the sponsoring group (which should have the necessary degrees of freedom to modify the initial design if necessary for early implementation). Within these general guidelines, the greatest possible freedom of action should be accorded to the Director.

Director and sponsor acting in concert should also choose, at as early a stage as possible, the advisory Board of Directors, representing a variety of interest groups to insure initial input from these groups in establishing the immediate goals and operational patterns of the Center.

9.5.3 Developing Funding Resources

Possible methods of funding a periodicals center have been discussed in Section 9.3. Selection of all elements of the

leadership of the Center (sponsor, Director, and Board of Directors) should be effected as early as possible so that in concert they may explore and develop the funding necessary to implement the creation of the Center.

9.5.4 Promoting the Center

It has been said that if you develop an effective mousetrap the world will beat a path to your door; American merchandising patterns have shown that it helps a great deal to provide effective signposts.

Promotion of the Center and its mission is important not only for generating the support necessary for establishing it, but for developing the clientele which will make its operation useful and viable. Use of the Center must be promoted through education of users. Peter Watson, in his report "Great Britain's National Lending Library," notes that in early development of the NLL, Urquhart[3] and a few others urged "that it should be NLL's responsibility not just archivally to store a national collection of modern science, but actively to promote its use -- to mount a well organized, vigorous, permanent educational campaign in the use of scientific literature...."[4]

Difficulty of access to periodical materials has inhibited their full utilization. Education of users in the scope and possibilities of periodical literature should narrow the gap between the availability of materials and their utilization.

---

[3] Dr. D. J. Urquhart, Director of the NLL.

[4] Watson, Peter G., Great Britain's National Lending Library, Los Angeles: UCLA School of Library Service, 1970, p. 11.

Permanent schedules of educational programs should be developed, not only to inform and educate the successive generations of scholars, researchers, and librarians, but to make feasible more effective and comprehensive utilization of this warehouse of information to satisfy the needs of general users of information.

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APPENDIX A

SURVEY OF LIBRARY DIRECTORS AND INTERLIBRARY LOAN LIBRARIANS

A.1 Summary of Survey

This appendix presents selected results of a mail survey of library directors and interlibrary loan librarians. The questionnaires solicited attitudes, opinions, and data on interlibrary loan activities. A nationally representative sample of 189 academic institutions was drawn for data collection purposes, and responses were received from 157 library directors and from 157 interlibrary loan librarians.

Relevant highlights of the survey results include:

Library Directors

- 42 percent stated that the volume of ILL lending is a burden; of these, 94 percent said cost of lending was the reason of burden, and 53 percent mentioned the photocopy load as the reason.
- 50 percent stated that photocopies of articles and microfilms of issues should be supplied by a national periodical resources center (NPRC).
- 66 percent felt that both commonly and little used titles should be stocked by an NPRC.
- 95 percent desired both English and non-English titles at an NPRC.
- 96 percent would support establishment of an NPRC.
- 53 percent would contribute back runs of little used materials to an NPRC.
- 87 percent would continue to fill requests for periodical materials even if an NPRC were established.
- 85 percent stated that an NPRC would affect acquisition policies; 75 percent of these directors would eliminate little used titles; 90 percent would review policies and holdings.

Interlibrary Loan Librarians

- 58 percent of libraries have access to a teletype for ILL.
- 62 percent prefer to borrow periodical materials in the form of photocopies.
- Maximum acceptable time delay in requesting materials from an NPRC (from time user makes request to time materials received in ILL office):

5 days	3 percent
7 days	15 percent
10 days	20 percent
14 days	37 percent
21 days	17 percent
Other	6 percent

- Minimum acceptable fill rate of an NPRC:

90 percent	31 percent
80 percent	29 percent
70 percent	21 percent
60 percent or less	10 percent
Other rate	4 percent

A.2 Introduction to the Survey

As one phase of investigating means of improving the present interlibrary loan system, Westat designed and conducted a survey of library directors and interlibrary loan librarians. The survey not only provided more background information on current interlibrary loan practices and policies in academic libraries, but also gathered suggestions and attitudes on both a national periodical resources center and an interlibrary loan fee system. The survey results served as planning data in designing a national periodical resources center and in developing a possible fee structure for interlibrary loan.

A.3 Sample Design

It was decided that the appropriate sampling universe for this survey would be the sampling frame developed for A Study of the Characteristics, Costs, and Magnitude of Interlibrary Loans in Academic Libraries (Westat, 1971). The sampling frame therefore consisted of the academic institutions reported in Library Statistics of Colleges and Universities, Data for Individual Institutions, Fall 1968 (USOE), the 1971 ARL membership list, and the American Library Directory. The 1971 sampling frame was updated for the 1973 study by substituting the 1973 ARL membership list.

As discussed in Appendix D of the 1971 study, four stratification variables were taken into account in selecting the sample:

1. Number of interlibrary loan transactions as indicated in the 1968 statistics for libraries published by the Office of Education,
2. Total volumes in collection,
3. Geographical location,
4. Type of institutional funding, public or private.

The stratification variables of primary interest for the 1973 survey were the total collection size and the public/private status. Public and private institutions were therefore each stratified as follows:

Stratum 1 - academic institutions with 20,000-99,999 volumes

2 - academic institutions with 100,000-499,999 volumes

3 - academic institutions (non-ARL) with 500,000 or more volumes

4 - ARL - member libraries

The total numbers of institutions in the sampling frame, taking into account the stratification variables, are presented in the chart below:

Stratum	Funding Source	
	Public	Private
1	247	589
2	161	193
3	24	13
4	47	28
Total	479	823

Using this frame, a systematic selection of institutions was made within each stratum. The sample size for each stratum was allocated in proportion to the number of volumes owned by the institutions in the stratum. All ARL libraries and those institutions with collection size 500,000 or greater were selected with certainty. The distribution of sampled institutions was as follows:

Stratum	Funding Source	
	Public	Private
1	7	17
2	19	19
3	24	13
4	47	28
Total	97	77

In addition, 15 other ARL-member libraries (non-U.S. and/or non-academic) were sampled with certainty bringing the total sample size to 189 libraries.

A.4 Survey Methodology

The data collection instruments, Form I-Director's Form and Form II-ILL Librarian's Form, were developed by Westat and

reviewed with the ARL Advisory Committee for the study. The forms were also pretested at the University of Maryland, the University of Colorado, and the University of Washington. The final revision of each questionnaire reflected the suggestions and reactions of the committee and the pretest participants.

Data collection involved a simple mail survey of the library director and ILL librarian at the 189 sample institutions. Survey packages were mailed to the library directors at the end of March, 1973; each package included survey materials for both the director and the ILL librarian. The library directors were asked to forward one copy of the cover letter, the ILL Librarian's Form, and a return envelope to the ILL librarian in his main library. The cover letter encouraged the respondents to return their completed questionnaires to Westat within two weeks and to contact Westat with any questions or problems. The cover letter and the survey questionnaires are shown in Exhibits 1, 2, and 3.

During the last two weeks of May, 1973, all nonrespondents were contacted by telephone. The nonrespondents were encouraged to complete and return their questionnaires at their earliest convenience. If the survey package had been lost in the mail or misplaced, Westat then provided additional copies to be completed as soon as possible. These followup activities aided in increasing the overall response rate for the survey.

A.5 Data Preparation and Tabulation

Completed questionnaires were returned to Westat by mail from the participating libraries. Each form received was logged in and assigned a unique identification number. The response rate was 83 percent both for the Director's Form and for the ILL librarian's Form. This response rate represents the proportion of sample

institutions from which usable returns were received. The few additional responses received were from libraries for which many of the questions were not applicable, and therefore the data was too sketchy for analysis.

Coding manuals were prepared specifically for the data collection forms used in this survey. Most of the questionnaire items were precoded, while coding categories for the open-ended questions were developed after inspection of the actual answers received. Responses were coded directly on each questionnaire.

After completion of the coding activities, the questionnaire responses were keypunched directly from the coded survey forms. The data cards were then edited manually (and corrected where necessary) in preparation for computer processing.

In the machine processing, data cards were read directly by the computer. Marginal tabulations and selected cross-tabulations were produced.

A.6 Survey Results

Selected unweighted results of this survey are presented in Tables A-1 - A-22 and in the body of this report. The tables summarize the responses of library directors and ILL librarians to questions concerning the design and operation of an NPRC. The tabulations were based on the numbers of respondents given below by library collection size.

Type of Respondent	Collection Size, as Sampled (Volumes)				Total
	20,000 - 99,999	100,000 - 499,999	500,000 and Over	Other ARL Members	
Director	16	29	102	10	157
ILL Librarian	15	30	102	10	157

Percentages in appendix Tables A-1 through A-22 were computed vertically except for Table A-22 where horizontal percentages were used. The proportions were based on the total number of respondents in each stratum so that, for example, the summary column of Table A-1 indicates that 39 percent of all responding directors felt that "cost of lending" best described the ILL lending burden in their libraries. This method of tabulation was used throughout the tables rather than basing proportions on the number of respondents for whom a particular question was applicable.

Further, tabulations such as Table A-3 summarize responses for each major category of the table stub (respondents were permitted a single response for each major category). The responses are presented as subcategories in the table stub. If "don't know" and "no answer" had been included as subcategories, each column for each major category would total 100 percent. Tables in this format should thus be read as if the subcategories for each major category sum to 100 percent. For example, the summary column of Table A-3 indicates that 76 percent (or 120 respondents) of all responding directors felt an obligation to serve members of networks or consortia to which they belong.

Exhibit 1

ASSOCIATION OF RESEARCH LIBRARIES

The Association of Research Libraries, under a grant from the National Science Foundation, is currently sponsoring a "Study of an Improved Interlibrary Loan System for Academic Libraries." As part of the overall study, ARL has contracted with Westat, Inc. of Rockville, Maryland, to investigate and make recommendations on two aspects of the interlibrary loan system; the Westat study covers (1) a more equitable method of financing interlibrary loans, and (2) the feasibility of a national periodicals resources center to provide long-range improvements in the system.

In order to obtain information and opinions on these topics from library directors and interlibrary loan librarians, Westat has designed the enclosed questionnaires. These forms have been sent to a nationally representative sample of 174 libraries, including 75 ARL member libraries. Questionnaires have also been sent to four Canadian academic libraries which are also members of ARL. Please complete Form I yourself, and ask the interlibrary loan librarian at your main library to respond to Form II (a copy of this letter is attached to Form II). Your responses will be most useful to Westat in recommending changes and improvements in the financial structure of ILL and in determining the feasibility of a national periodicals resources center.

Your cooperation in this important study will be greatly appreciated. Please complete and return the enclosed forms to Westat by April 15. If you have any questions, contact either Gene Palmour or Lucy Gray at Westat, (301) 881-5310.

Sincerely,

Stephen A. McCarthy
Executive Director

INTERLIBRARY LOAN STUDY

DIRECTOR'S FORM

Name of Institution: _____

Name and Address of Main Library: _____

_____

_____

Person Completing Questionnaire: _____

Title: _____

Upon completion of this questionnaire, please return it to

Westat, Inc.
11600 Nebel Street
Rockville, Maryland 20852

If you have any questions, please contact V. E. Palmour at (301) 881-5310 (call collect).

INTRODUCTION

Many large libraries are experiencing an increasingly burdensome volume of interlibrary loan requests. While it is certainly not possible for any library to meet all of its own needs and librarians are understandably reluctant to impede the exchange of materials, the drain on library resources of some large libraries is considerable, and it becomes increasingly evident that the interlibrary loan system must both become more efficient and dependable and incorporate some equitable measures for compensating heavy lenders.

The Association of Research Libraries, through Westat, Inc., is attempting to develop a system embodying such measures for recommendation to its members. This questionnaire is designed to elicit the patterns and problems of ILL lending and borrowing at your institution, as well as your preferences for methods of improvement. It is of the utmost importance that any system recommended be relevant to the range of needs of member libraries. Your cooperation in supplying the data requested, as well as your comments and suggestions, will be most helpful.

INSTRUCTIONS

- In responding to this questionnaire, you will find several types of questions. The format is such that, in most questions, you will circle the number(s) next to the answer(s) you select; the remaining questions call for either "fill-in-the-blank" or discussion-type answers.
- Unless otherwise specified, please base your responses on your own experience and/or your own opinion of the topics under discussion.
- Your responses will be summarized with those of other librarians to provide guidelines for Westat in the design of possible financing methods for ILL and of a feasible national periodicals resources center.

INTERLIBRARY LENDING

1a. Is the volume of ILL lending at your library a burden on your resources and services?

Yes. 1
No . . *(Skip to Q. 2a)* 2

1b. If yes, in what way(s)? *(Circle all that apply.)*

Cost of lending. 1
Deterioration of materials 2
Loss of local use. 3
Photocopying load. 4
Other *(Specify)* _____ 5

2a. Do you belong to any consortium or network cooperative arrangement with other libraries for interlibrary loans?

Yes. 1
No . . . *(Skip to Q. 3)* 2

2b. If yes, please identify by name under the appropriate category below:

Local _____

_____

State _____

_____

Regional _____

_____

National _____

_____

3. What is your attitude toward ILL lending of materials to the following categories of borrowers? *(Please circle those answers that best express your views.)*

	Attitude toward ILL service			
Category of borrowing library	We have an obligation to serve	No obligation but are willing to serve	Would prefer to serve only those in-state	Think we should not serve
Members of network or consortium to which we belong. . .	1	2	3	4
ARL libraries.	1	2	3	4
Academic libraries (with undergraduate programs only).	1	2	3	4
Academic libraries (with graduate programs)	1	2	3	4
Public libraries	1	2	3	4
Government research libraries.	1	2	3	4
Special libraries.	1	2	3	4
Any library requesting loan. . . .	1	2	3	4
Other *(Specify)* _____	1	2	3	4

4a. Are there circumstances in which academic libraries should be compensated for interlibrary lending activities?

No . . . . . *(Skip to Q. 5a)* 1
Only privately funded libraries should be compensated. . . . . *(Skip to Q. 5a)* 2
Yes, if requests for loans exceed the borrowing requests sent to the same library *(Skip to Q. 5a)* 3
Yes, in all cases. . . . . *(Skip to Q. 5a)* 4
Yes, in some cases 5

4b. If you circled (5) above, please indicate below those borrowing libraries from which compensation should be received.

Category of borrowing library	In-state	Out-of-state
Members of network or consortium to which we belong	1	2
ARL libraries	1	2
Academic libraries (with undergraduate programs only)	1	2
Academic libraries (with graduate programs)	1	2
Public libraries	1	2
Government research libraries	1	2
Special libraries	1	2
Any library requesting loan	1	2
Other *(Specify)*_____	1	2

5a. Do you receive any compensation for interlibrary lending activities?

Yes. 1
No . . . *(Skip to Q. 6a)* 2

5b. If yes, list sources (e.g., borrowing library, state network, industries, etc.) and indicate method of payment received (e.g.,grant, per transaction fees paid on some cumulative basis, etc.).

Source	Method of payment
_____	_____
_____	_____
_____	_____
_____	_____

6a. Are you contemplating any measures to recover costs of interlibrary lending?

Yes. 1
No . . . . *(Skip to Q. 7)* 2

6b. If yes, please describe: _____

_____

_____

_____

7. If you were to institute such charges, would you ask payment for *(circle all that apply)*:

Filled requests. 1
Searching of unfilled requests 2
Photocopies. 3
Other *(Specify)* _____ 4

8. Would charges for interlibrary lending services be *(circle all that apply)*:

A flat fee for each request. 1
Different for filled and unfilled requests . 2
Higher if verification were required 3
Other *(Specify)* _____ 4

INTERLIBRARY BORROWING

9. Do you feel that needs of your users for items not available in your collection are adequately met through current ILL operations?

	Yes	No
For monographs	1	2
For periodicals.	1	2
For other materials *(Specify)*. .	1	2

_____

10a. If your library had to pay a fee for all materials borrowed through ILL, what effect would this have on your ILL borrowing policies?

No change in borrowing policies or volume . . . . . *(Skip to Q. 11)* 1
Seek other sources for materials needed. . . . . *(Skip to Q. 11)* 2
Change policies on user eligibility for ILL . . . . . *(Skip to Q. 11)* 3

How? _____

Pass charge on to our own patron making ILL request 4
Other *(Specify)*. . . . . *(Skip to Q. 11)* 5

_____

10b. If you circled (4) in Q. 10a, please indicate in the chart below which of your patrons would be charged for interlibrary borrowing services.

Type of patron	Currently eligible to use ILL	Would pass on partial cost of fee	Would pass on total cost of fee	Would charge flat fee	Pass on fee for photocopies only	Would not charge fee
Faculty	1	2	3	4	5	6
Staff	1	2	3	4	5	6
Master's candidates.	1	2	3	4	5	6
Doctoral candidates.	1	2	3	4	5	6
Undergraduates. . .	1	2	3	4	5	6
Other *(Specify)* _____	1	2	3	4	5	6

11. If a fee system for interlibrary borrowing and lending were instituted, what would you prefer as the method for paying and collecting fees? *(Please circle only one answer.)*

Billing by lending library and payment by borrowing library against:

Individual transaction 01
Monthly statement. 02
Quarterly statement. 03
Semi-annual statement. 04
Annual statement 05

A clearinghouse operation which would provide for net billing or payment (determined by status as net lender or borrower) for individual libraries against:

Monthly statement. 06
Quarterly statement. 07
Semi-annual statement. 08
Annual statement 09
Deposit account. 10

Other *(Specify)* _____ 11

12. If you have any other comments or suggestions on compensation for interlibrary lending and borrowing, please give them in the following space.

_____
_____
_____
_____
_____
_____
_____
_____

About half of all ILL requests in 1970/71 involved periodical materials. Of this number, it is estimated that approximately half the requests went unfilled because the material was in use, non-circulating, in bindery, missing, or was not owned by the library to which the request was sent. Among large libraries, almost three-quarters of the periodicals requested were in the English language.

It has been suggested that a national periodicals resources center be established which would provide fast, dependable service for needed periodical materials.

13. Assuming that a reasonable charge for services was made to support the operation of the center, what should such a center provide?

Photocopies only (requests for original issues to be directed to normal ILL channels). 1
Photocopies or original, as requested. 2
Photocopies of articles and microfilms of issues, as requested. 3
Other *(Specify)* _____ 4

14. Should the titles held by the center be:

Most commonly used 1
Little used. 2
Both commonly and little used. 3

15. Should the center hold:

Only English-language materials. 1
Only non-English-language materials. 2
Both English and non-English 3
Other *(Specify)* _____ 4

16a. If a periodicals resources center could improve both the current speed of delivery and dependability in meeting ILL needs, would you support its establishment?

Yes 1
No . . *(Skip to Q. 17)* 2

16b. If yes, in what ways *(circle as many as apply)*?

By membership fee (if required). 1
By payment for individual requests (transaction basis) 2
By contributing back runs of little used materials 3
Other *(Specify)* _____ 4

17. If a transaction fee were used, either alone or in combination with a membership fee, would you prefer:

Flat fee (coupon book) 1
Invoice for each transaction 2
Deposit account. 3
Monthly statement. 4
Quarterly statement. 5
Annual statement 6
Other *(Specify)* _____ 7

18a. If periodical materials were available through a national resources center, would you continue to fill ILL requests for these materials?

Yes 1
No . . *(Skip to Q. 19a)* 2

18b. If yes, to what extent?

Only for materials not available at center 1
For any materials requested. 2
Only for libraries in network(s) to which we have commitments 3
Only requests from local libraries 4
Other *(Specify)* _____ 5

19a. Would availability of materials from a dependable resources center have any effect upon your periodicals acquisition policies?

Yes 1
No . . *(Skip to Q. 20)* 2

19b. If yes, how? *(Circle as many as apply.)*

Eliminate little used journals 1
Reduce number of copies of some journals 2
Encourage review of policies and holdings in terms of use, alternate sources, retention of back issues, etc. 3
Other *(Specify)* _____ 4

20. Please give any other comments on your idea of a national periodicals resources center, especially on possible funding for both establishment and continuing support of such a center.

THANK YOU FOR YOUR COOPERATION.

INTERLIBRARY LOAN STUDY

ILL LIBRARIAN'S FORM

Name of Institution: _____

Name and Address of Main Library: _____

_____

_____

Person Completing Questionnaire: _____

Title: _____

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- Your responses will be summarized with those of other librarians to provide guidelines for Westat in the design of possible financing methods for ILL and of a feasible national periodicals resources center.

ILL ACTIVITIES

1a. Please summarize your interlibrary lending and borrowing activities for the year 1972 in the chart below.

Activity	Total number of requests	Number filled	Number not filled
LENDING			
Total (all materials)	_____	_____	_____
Periodicals	_____	_____	_____
Photocopies	_____	_____	_____
BORROWING			
Total (all materials)	_____	_____	_____
Periodicals	_____	_____	_____
Photocopies	_____	_____	_____

1b. Do the figures reported above represent:

Volumes 1
Titles. 2

1c. What is the total number of volumes held by your library?

_____ (volumes)

2. Does your library use a teletype facility for interlibrary borrowing and lending?

Yes 1
No. 2

3. Please complete the following chart by estimating the percent of borrowing and lending requests which you transmit or receive by:

	Borrowing	Lending
Mail	_____%	_____%
TWX	_____%	_____%
Other *(Specify)*_____	_____%	_____%

INTERLIBRARY LENDING

4. Are interlibrary loan requests for photocopies referred to a separate reproduction department?

Yes 1
No. 2

5. Under which of the following conditions do you provide photocopies of periodical material requested of you through interlibrary loan? Do you charge the borrowing library for the photocopies?

Conditions	Provide photocopies		Charge for photocopies	
	yes	no	yes	no
For all periodical requests.	1	2	3	4
For non-circulating materials.	1	2	3	4
Only when photocopy is requested	1	2	3	4
Routinely to network or consortium members . .	1	2	3	4
On request to network or consortium members. .	1	2	3	4
Other *(Specify)* _____	1	2	3	4

In the following questions we would like to obtain an idea of the process you generally use in selecting a library to which an ILL borrowing request is sent.

6. What is the most important factor in selecting a library to which an ILL request is sent?

_____

_____

_____

_____

7. What are your most important bibliographic tools for determining the library from which you will request a desired item? *(Circle all that apply.)*

Network or cooperative tool *(Specify)* _____

_____ 1

Catalog(s) *(Specify)* _____

_____ 2

In-house tools *(Specify)* _____

_____ 3

Other *(Specify those most commonly used)* _____

_____

_____ 4

8a. Do you utilize any bibliographic centers (e.g., Denver, Philadelphia, CRL) to verify and locate materials needed?

Yes 1
No. . . . . *(Skip to Q. 9)* 2

8b. If yes, please identify the centers below and note degree of success in verification and location at each.

Center	Degree of success: Verification	Location
_____	_____%	_____%
_____	_____%	_____%
_____	_____%	_____%
_____	_____%	_____%

9. Why do you select a specific library when no source is known? *(Circle all that apply.)*

Because we both belong to the same network or cooperative arrangement. 1
Because of location of library in relation to mine. 2
Because of past success in subject area at that library 3
Because of library subject collection 4
Because of size of library. 5
Because of general cooperativeness of library to which request is dispatched 6
Because of general likelihood of success. 7
Other *(Specify)* _____ 8

10a. Are unfilled requests forwarded to several libraries before the request is permanently considered unfilled?

Yes 1
No. . . . . *(Skip to Q. 11)* 2

10b. If yes, what is the average number of additional attempts?

_____

11. Do you use the three national libraries as ILL resources?

	Routinely	Seldom	As last Resort	Never
NAL for all agricultural materials.	1	2	3	4
NAL for agricultural materials not available elsewhere.	1	2	3	4
NLM system for all medical materials	1	2	3	4
NLM system for medical materials not available elsewhere.	1	2	3	4
LC for materials in any field	1	2	3	4
LC for materials in any field not located elsewhere.	1	2	3	4

12a. Do you order photocopies of periodical articles?

Yes 1
No. . . . . *(Skip to Q. 13)* 2

12b. If yes, under what circumstances?

Routinely 1
When patron requests it and is willing to pay for it 2
Only when original cannot be supplied 3
Other *(Specify)* _____ 4

13. If available, in what form do you prefer borrowing periodical materials?

Original. 1
Photocopy 2
Microform 3
Tearsheets. 4
Other *(Specify)* _____ 5

14a. Do you charge your patrons (or their departments, research project funds, etc.) for photocopies obtained through ILL whenever the lending library charges your library?

Yes 1
No. . . . . *(Skip to Q. 15)* 2

14b. If yes, under what circumstances?

Always. 1
Some categories of users only 2
Other *(Specify)* _____ 3

NATIONAL PERIODICALS RESOURCES CENTER

About half of all ILL transactions in 1970/71 involved periodical materials. Of this number it is estimated that approximately half of the requests went unfilled because the material was in use, non-circulating, in bindery, missing, or was not owned by the library to which the request was sent. Among large libraries, almost three-quarters of the periodicals requested were in the English language.

It has been suggested that a national periodicals resources center be established which would provide fast, dependable service for needed periodical materials.

15a. From the viewpoint of your patrons, what would be the maximum acceptable time delay in requesting materials from the center (from time user makes request to time materials received in your office).

5 days. 1
7 days. 2
10 days 3
14 days 4
21 days 5
Other *(Specify)* _____ 6

15b. From the viewpoint of your patrons, what would be the minimum acceptable fill rate from the center?

90 percent. 1
80 percent. 2
70 percent. 3
60 percent. 4
50 percent. 5
Other *(Specify)* _____ 6

15c. Please describe below any other characteristics that would be desirable in a national periodicals resources center.

_____

_____

_____

_____

16. Please indicate, for periodicals in each subject field below, the frequency of use, language, and currency that would satisfy most of your borrowing requirements for periodical materials.

Periodicals by subject, frequency of use, and language	Current titles			Deceased titles		
	Last 12 months	Last 10 years	Vol. 1, No. 1 to date	Last 12 months	Last 10 years	Full set
Humanities						
• Commonly used titles						
English 1	2	3	4	5	6	
Western European language. 1	2	3	4	5	6	
Other foreign language. 1	2	3	4	5	6	
• Little used titles						
English 1	2	3	4	5	6	
Western European language. 1	2	3	4	5	6	
Other foreign language. 1	2	3	4	5	6	
Social Sciences						
• Commonly used titles						
English 1	2	3	4	5	6	
Western European language. 1	2	3	4	5	6	
Other foreign language. 1	2	3	4	5	6	
• Little used titles						
English 1	2	3	4	5	6	
Western European language. 1	2	3	4	5	6	
Other foreign language. 1	2	3	4	5	6	
Science and Technology						
• Commonly used titles						
English 1	2	3	4	5	6	
Western European language. 1	2	3	4	5	6	
Other foreign language. 1	2	3	4	5	6	
• Little used titles						
English 1	2	3	4	5	6	
Western European language. 1	2	3	4	5	6	
Other foreign language. 1	2	3	4	5	6	
Other *(Specify)*_____ _____ 1	2	3	4	5	6	

17a. If periodical materials were available to all libraries through a periodicals resources center, would you continue to fill requests from other libraries for periodical materials?

Yes 1
No. . . . . *(Skip to Q. 18)* 2

17b. If yes, to what extent? *(Circle all that apply.)*

Only for libraries to which we have existing commitments 1
For all libraries which we presently serve. 2
Only for local libraries. 3
Only for materials not available at the center 4
For any materials requested 5
Other *(Specify)* _____ 6

18. Please use the space below to make comments and suggestions that you feel would be helpful in our feasibility study of a national periodicals resources center.

THANK YOU FOR YOUR COOPERATION.

Table A-1 Directors: Type of ILL lending burden experienced by collection size of responding library

ILL Lending Burden	Collection Size, As Sampled (Volumes)					Total Respondents
	20,000-99,999	100,000-499,999	500,000 and over	Other ARL Members	All Libraries	
None	100%	93%	41%	50%	57%	90
Yes	-	7%	58%	50%	42%	66
Cost of lending	-	7%	55%	40%	39%	62
Deterioration of materials	-	3%	23%	20%	17%	26
Loss of local use	-	3%	23%	-	15%	24
Photocopying load	-	3%	28%	50%	22%	35
Other	-	3%	7%	-	5%	8
Don't Know	-	-	-	-	-	0
No Answer	-	-	1%	-	1%	1
TOTAL	100%	100%	100%	100%	100%	157

Table A-1a Directors: Type of ILL lending burden experienced by collection size of responding library and by public/private status of library

ILL Lending Burden	Collection Size, As Sampled (Volumes)					
	20,000 - 99,999		100,000 - 499,999		500,000 and over	
	Public	Private	Public	Private	Public	Private
None	100%	100%	87%	100%	44%	37%
Yes	-	-	13%	-	54%	63%
Cost of lending	-	-	13%	-	49%	63%
Deterioration of materials	-	-	7%	-	21%	24%
Loss of local use	-	-	7%	-	23%	21%
Photocopying load	-	-	7%	-	33%	22%
Other	-	-	7%	-	7%	7%
Don't Know	-	-	-	-	-	-
No Answer	-	-	-	-	2%	-
TOTAL	100%	100%	100%	100%	100%	100%

Table A-2 Directors: Membership in consortia or networks by collection size of responding library

Membership in Consortia or Networks	Collection Size, As Sampled (Volumes)					Total Respondents
	20,000-99,999	100,000-499,999	500,000 and over	Other ARL Members	All Libraries	
None	38%	31%	7%	30%	16%	25
Yes	62%	69%	93%	70%	84%	132
local only	13%	10%	8%	-	10%	13
state only	25%	14%	15%	20%	19%	25
regional only	13%	7%	7%	10%	9%	12
national only	-	-	2%	10%	2%	3
local and state	6%	21%	13%	-	16%	20
local and regional	-	7%	3%	-	4%	5
local and national	-	-	1%	-	1%	1
state and regional	-	-	14%	10%	12%	15
state and national	-	-	9%	10%	8%	10
regional and national	-	3%	-	-	1%	1
local, state, and regional	-	3%	8%	-	7%	9
local, state, and national	-	-	3%	-	2%	3
local, regional, and national	6%	-	-	-	1%	1
state, regional, and national	-	-	7%	10%	6%	8
local, state, regional, and national	-	-	5%	-	4%	5
Don't Know	-	-	-	-	-	0
No Answer	-	-	-	-	-	0
TOTAL	100%	100%	100%	100%	100%	157

Table A-3 Directors: Attitude toward lending to types of borrowing libraries by collection size of responding library

Attitude Toward Lending To:	Collection Size, As Sampled (Volumes)					Total Respondents
	20,000-99,999	100,000-499,999	500,000 and over	Other ARL Members	All Libraries	
Members of network or consortium						
obligation to serve	50%	62%	84%	80%	76%	120
no obligation, willing to serve	19%	17%	7%	-	10%	15
prefer to serve in-state only	-	-	-	-	-	0
think we should not serve	-	-	-	-	-	0
ARL libraries						
obligation to serve	19%	41%	49%	70%	46%	72
no obligation, willing to serve	50%	48%	45%	10%	44%	69
prefer to serve in-state only	-	-	-	-	-	0
think we should not serve	-	4%	-	-	1%	1
Academic libraries (undergraduate programs only)						
obligation to serve	19%	21%	12%	40%	16%	25
no obligation, willing to serve	56%	48%	35%	10%	38%	60
prefer to serve in-state only	-	10%	28%	10%	21%	33
think we should not serve	6%	7%	16%	-	12%	19
Academic libraries (with graduate programs)						
obligation to serve	25%	45%	43%	70%	43%	68
no obligation, willing to serve	63%	45%	49%	20%	48%	75
prefer to serve in-state only	-	3%	2%	-	2%	3
think we should not serve	-	3%	-	-	1%	1
Public libraries						
obligation to serve	13%	14%	12%	50%	15%	23
no obligation, willing to serve	50%	34%	37%	20%	37%	58
prefer to serve in-state only	19%	24%	39%	-	32%	50
think we should not serve	6%	14%	5%	-	6%	10

Table A-3(continued)

Attitude Toward Lending To:	Collection Size, As Sampled (Volumes)					Total Respondents
	20,000-99,999	100,000-499,999	500,000 and over	Other ARL Members	All Libraries	
Government Research libraries						
obligation to serve	13%	28%	25%	70%	28%	43
no obligation, willing to serve	63%	55%	64%	10%	59%	92
prefer to serve in-state only	-	3%	5%	-	4%	6
think we should not serve	-	3%	-	-	1%	1
Special Libraries						
obligation to serve	13%	21%	14%	60%	18%	28
no obligation, willing to serve	63%	59%	59%	20%	57%	89
prefer to serve in-state only	6%	7%	20%	-	15%	23
think we should not serve	6%	3%	1%	-	2%	3
Any library requesting a loan						
obligation to serve	13%	14%	9%	30%	13%	20
no obligation, willing to serve	63%	48%	46%	30%	47%	74
prefer to serve in-state only	13%	17%	24%	-	20%	31
think we should not serve	6%	7%	17%	10%	14%	21
Other libraries						
obligation to serve	-	3%	3%	10%	3%	5
no obligation, willing to serve	-	7%	1%	10%	3%	4
prefer to serve in-state only	-	-	1%	-	1%	1
think we should not serve	-	7%	4%	-	4%	6

Table A-4 Directors: Adequacy of current ILL operation in meeting user needs for material not available in own collection, by collection size of responding library

Adequacy of Current ILL	Collection Size, As Sampled (Volumes)					Total Respondents
	20,000-99,999	100,000-499,999	500,000 and over	Other ARL Members	All Libraries	
For monographs						
adequate	81%	79%	76%	60%	76%	120
not adequate	13%	21%	23%	20%	21%	33
For periodicals						
adequate	75%	79%	73%	50%	73%	114
not adequate	13%	17%	25%	30%	23%	36
For other materials						
adequate	19%	27%	19%	30%	22%	34
not adequate	6%	14%	10%	10%	10%	16

Table A-5 Directors: Preference for form of material to be supplied by a national periodicals resources center, by collection size of responding library

Form of Material Preferred	Collection Size, As Sampled (Volumes)					Total Respondents
	20,000 -99,999	100,000- 499,999	500,000 and over	Other ARL Members	All Libraries	
Photocopies only	19%	34%	19%	10%	21%	33
Photocopies or original as requested	12%	7%	31%	30%	25%	39
Photocopies of articles and microfilms of issues, as requested	63%	55%	46%	60%	50%	79
Other forms of material	6%	4%	4%	-	4%	6
TOTAL	100%	100%	100%	100%	100%	157

Table A-6 Directors: Preference for frequency of use of titles to be held by a national periodicals resources center, by collection size of responding library

Preference	Collection Size, As Sampled (Volumes)					Total Respondents
	20,000-99,999	100,000-499,999	500,000 and over	Other ARL Members	All Libraries	
Most commonly used titles	6%	-	1%	-	1%	2
Little used titles	6%	21%	39%	30%	32%	50
Both commonly and little used titles	88%	76%	60%	70%	66%	104
No answer	-	3%	-	-	1%	1
TOTAL	100%	100%	100%	100%	100%	157

Table A-7 Directors: Preference for language of material to be held by a national periodicals resources center, by collection size of responding library

Language Preference	Collection Size, As Sampled (Volumes)					Total Respondents
	20,000-99,999	100,000-499,999	500,000 and over	Other ARL Members	All Libraries	
Only English-language materials	25%	7%	-	-	4%	6
Only non-English-language materials	-	-	2%	-	1%	2
Both English and non-English	75%	93%	98%	100%	95%	149
Other language preference	-	-	-	-	-	0
TOTAL	100%	100%	100%	100%	100%	157

Table A-8 Directors: Attitude toward supporting establishment of a national periodicals resources center, by collection size of responding library

Attitude	Collection Size, As Sampled (Volumes)					Total Respondents
	20,000-99,999	100,000-499,999	500,000 and over	Other ARL Members	All Libraries	
Would not support a center	7%	3%	3%	-	3%	5
Would support a center	93%	97%	96%	100%	96%	151
by membership fee	44%	72%	83%	60%	76%	119
by payment for individual requests	88%	66%	73%	90%	74%	116
by contributing back runs of little used material	56%	45%	58%	20%	53%	83
by other means	-	-	2%	10%	2%	3
Don't know	-	-	-	-	-	0
No answer	-	-	1%	-	1%	1
TOTAL	100%	100%	100%	100%	100%	157

Table A-9 Directors: Preference for payment of transaction fees to a national periodicals resources center, by collection size of responding library

Preference	Collection Size, As Sampled (Volumes)					Total Respondents
	20,000-99,999	100,000-499,999	500,000 and over	Other ARL Members	All Libraries	
Flat fee (coupon book)	19%	21%	21%	30%	21%	33
Invoice for each transaction	38%	21%	7%	-	12%	19
Deposit account	18%	28%	24%	20%	24%	38
Monthly statement	13%	14%	17%	20%	16%	25
Quarterly statement	6%	10%	25%	10%	20%	31
Annual statement	6%	-	4%	20%	4%	7
Other method of payment	-	3%	1%	-	1%	2
Don't know	-	-	-	-	-	0
No answer	-	3%	1%	-	2%	2
TOTAL	100%	100%	100%	100%	100%	157

Table A-10 Directors: Attitude toward continuing to fill ILL requests for periodical materials if a national periodicals resources center were established, by collection size of responding library

Attitude	Collection Size, As Sampled (Volumes)					Total Respondents
	20,000-99,999	100,000-499,999	500,000 and over	Other ARL Members	All Libraries	
Would not continue	19%	14%	11%	-	11%	18
Would continue	81%	83%	88%	90%	87%	136
only for materials not available at center	13%	21%	42%	50%	36%	56
for any materials requested	44%	24%	21%	30%	24%	38
only for libraries in networks to which we have commitments	25%	24%	47%	20%	39%	61
only requests from local libraries	-	21%	23%	30%	20%	32
for other situations	6%	7%	3%	20%	5%	8
Don't know	-	-	-	-	-	0
No answer	-	3%	1%	10%	2%	3
TOTAL	100%	100%	100%	100%	100%	157

Table A-11 Directors: Effect of dependable resources center upon periodicals acquisition policies, by collection size of responding library

Effect on Acquisition Policies	Collection Size, As Sampled (Volumes)					Total Respondents
	20,000-99,999	100,000-499,999	500,000 and over	Other ARL Members	All Libraries	
No effect	37%	24%	9%	10%	15%	23
Some effect	63%	76%	91%	90%	85%	134
Eliminate little used journals	38%	55%	71%	60%	64%	100
Reduce number of copies of some journals	-	17%	29%	-	22%	35
Encourage review of policies, holdings.....	56%	62%	83%	90%	77%	121
Other action	-	-	1%	-	1%	1
Don't know	-	-	-	-	-	0
No response	-	-	-	-	-	0
TOTAL	100%	100%	100%	100%	100%	157

Table A-12 ILL Librarians: Availability of teletype facility for ILL activities, by collection size of responding library

Availability of Teletype Facility	Collection Size, As Sampled (Volumes)					Total Respondents
	20,000-99,999	100,000-499,999	500,000 and over	Other ARL Members	All Libraries	
Yes	20%	40%	66%	90%	58%	91
No	80%	60%	34%	10%	42%	66
Don't know	-	-	-	-	-	-
No answer	-	-	-	-	-	-
TOTAL	100%	100%	100%	100%	100%	157

Table A-13 ILL Librarians: Proportion of interlibrary borrowing activity conducted by TWX, by collection size of responding library

Proportion of Borrowing by TWX	Collection Size, As Sampled (Volumes)					Total Respondents
	20,000 -99,999	100,000- 499,999	500,000 and over	Other ARL Members	All Libraries	
None	67%	57%	37%	30%	43%	68
1 - 9 percent	-	17%	11%	10%	11%	17
10 - 24 percent	-	-	14%	10%	9%	15
25 - 49 percent	-	13%	15%	20%	14%	22
50 - 74 percent	7%	3%	16%	20%	13%	20
75 - 100 percent	13%	7%	6%	-	7%	10
Don't know/ no answer	13%	3%	1%	10%	3%	5
TOTAL	100%	100%	100%	100%	100%	157

Table A-14 ILL Librarians: Proportion of interlibrary lending activity conducted by TWX, by collection size of responding library

Proportion of Lending by TWX	Collection Size, As Sampled (Volumes)					Total Respondents
	20,000-99,999	100,000-499,999	500,000 and over	Other ARL Members	All Libraries	
None	87%	67%	33%	10%	43%	68
1 - 9 percent	-	7%	11%	10%	9%	14
10 - 24 percent	-	3%	15%	10%	11%	17
25 - 49 percent	-	7%	21%	30%	17%	27
50 - 74 percent	-	3%	15%	-	10%	16
75 - 100 percent	-	7%	3%	30%	5%	8
Don't know/no answer	13%	6%	2%	10%	5%	7
TOTAL	100%	100%	100%	100%	100%	157

Table A-15 ILL Librarians: Referral of requests for photocopies to a separate reproduction department, by collection size of responding library.

Referral of Photocopy Requests	Collection Size, As Sampled (Volumes)					Total Respondents
	20,000-99,999	100,000-499,999	500,000 and over	Other ARL Members	All Libraries	
Yes	-	10%	28%	70%	25%	39
No	80%	90%	72%	30%	73%	115
Don't know	-	-	-	-	-	-
No answer	20%	-	-	-	2%	3
TOTAL	100%	100%	100%	100%	100%	157

Table A-16 ILL Librarians: Photocopying policies by collection size of responding library

Policy on Providing Photocopies	Collection Size, As Sampled (Volumes)					Total Respondents
	20,000-99,999	100,000-499,999	500,000 and over	Other ARL Members	All Libraries	
For all periodical requests						
copies provided	33%	53%	47%	70%	48%	76
charge fee for copies	27%	37%	56%	60%	50%	78
For non-circulating materials						
copies provided	20%	40%	41%	50%	39%	62
charge fee for copies	7%	30%	40%	50%	36%	56
Only when photocopy requested						
copies provided	27%	43%	57%	30%	50%	78
charge fee for copies	13%	47%	63%	40%	54%	84
Routinely to network/consortium						
copies provided	7%	30%	37%	30%	32%	51
charge fee for copies	-	[illegible]%	17%	10%	12%	19
On request to network/consortium						
copies provided	7%	33%	41%	20%	35%	55
charge fee for copies	-	17%	26%	-	20%	32
Other conditions						
copies provided	-	7%	13%	10%	10%	16
charge fee for copies	-	7%	8%	10%	7%	11

Table A-17 ILL Librarians: Most important factor in selecting library to which ILL request is sent, by collection size of responding library

Factor(s)	Collection Size, As Sampled (Volumes)					Total Respondents
	20,000-99,999	100,000-499,999	500,000 and over	Other ARL Members	All Libraries	
Proximity (location)	7%	13%	13%	20%	14%	21
Subject holdings	7%	7%	9%	10%	8%	13
Cost	-	-	-	-	-	0
Speed (efficiency)	-	7%	3%	10%	4%	6
Cooperation	33%	10%	1%	10%	6%	10
Verification	20%	7%	13%	-	12%	18
Past experience	7%	-	1%	-	1%	2
Proximity, subject holdings	13%	20%	7%	10%	10%	16
Proximity, cost	-	7%	6%	-	5%	8
Proximity, speed	-	17%	4%	10%	6%	10
Proximity, cooperation	-	3%	10%	-	8%	12
Proximity, verification	-	6%	7%	10%	6%	10
Proximity, past experience	-	-	2%	-	1%	2
Subject holdings, cost	-	-	-	-	-	0
Subject holdings, speed	-	-	2%	-	1%	2
Subject holdings, cooperation	-	-	2%	-	1%	2
Subject holdings, verification	-	-	2%	-	1%	2
Subject holdings, past experience	-	3%	2%	-	2%	3
Cost, speed	-	-	5%	20%	5%	7
Cost, cooperation	-	-	-	-	-	0
Cost, verification	-	-	-	-	-	0
Cost, past experience	-	-	-	-	-	0
Speed, cooperation	-	-	1%	-	1%	1
Speed, verification	-	-	4%	-	3%	4
Speed, past experience	7%	-	2%	-	2%	3
Cooperation, verification	-	-	1%	-	1%	1
Cooperation, past experience	-	-	1%	-	1%	1
Verification, past experience	-	-	2%	-	1%	2
Don't know/no answer	6%	-	-	-	-	1
TOTAL	100%	100%	100%	100%	100%	157

Table A-18 ILL Librarians: Use of the three national libraries as ILL resources, by collection size of responding library

Use of National Libraries	Collection Size, As Sampled (Volumes)					Total Respondents
	20,000-99,999	100,000-499,999	500,000 and over	Other ARL Members	All Libraries	
NAL for all agricultural materials						
routinely	-	-	3%	10%	2%	4
seldom	7%	10%	29%	-	22%	34
as last resort	-	13%	31%	30%	25%	39
never	60%	54%	12%	20%	25%	39
NAL for agricultural materials not available elsewhere						
routinely	-	17%	48%	10%	35%	55
seldom	-	-	14%	20%	10%	16
as last resort	-	17%	22%	30%	20%	31
never	53%	43%	6%	20%	18%	29
NLM system for all medical materials						
routinely	-	16%	27%	20%	22%	35
seldom	7%	20%	21%	-	18%	28
as last resort	-	10%	22%	30%	19%	29
never	60%	37%	12%	30%	22%	35
NLM system for medical materials not available elsewhere						
routinely	-	33%	55%	20%	43%	68
seldom	7%	10%	9%	10%	9%	14
as last resort	-	13%	15%	40%	15%	24
never	53%	27%	3%	10%	13%	20
LC for materials in any field						
routinely	-	10%	11%	20%	10%	16
seldom	7%	33%	17%	-	18%	29
as last resort	13%	30%	40%	40%	36%	56
never	40%	10%	8%	20%	12%	19
LC for any materials not located elsewhere						
routinely	7%	50%	66%	30%	55%	86
seldom	7%	13%	7%	10%	8%	13
as last resort	26%	30%	21%	50%	25%	40
never	33%	7%	1%	-	5%	8

Table A-19 ILL Librarians: Preference for form of material in borrowing periodical materials, by collection size of responding library

Preference for Form of Material (Periodical Requests)	Collection Size, As Sampled (Volumes)					Total Respondents
	20,000 -99,999	100,000- 499,999	500,000 and over	Other ARL Members	All Libraries	
Original	33%	17%	33%	40%	31%	48
Photocopy	67%	80%	59%	40%	62%	98
Microform	-	-	1%	10%	1%	2
Tearsheets	-	-	3%	-	2%	3
Other	-	3%	4%	10%	4%	6
Don't know	-	-	-	-	-	0
No answer	-	-	-	-	-	0
TOTAL	100%	100%	100%	100%	100%	157

Table A-20 ILL Librarians: Maximum acceptable time delay in requesting material from a national periodicals resources center, by collection size of responding library

Maximum Acceptable Time Delay	Collection Size, As Sampled (Volumes)					Total Respondents
	20,000-99,999	100,000-499,999	500,000 and over	Other ARL Members	All Libraries	
5 days	-	7%	3%	-	3%	5
7 days	27%	17%	15%	-	15%	24
10 days	13%	30%	17%	30%	20%	32
14 days	40%	33%	38%	30%	37%	58
21 days	20%	13%	17%	30%	17%	27
Other	-	-	9%	-	6%	9
Don't know	-	-	-	10%	1%	1
No answer	-	-	1%	-	1%	1
TOTAL	100%	100%	100%	100%	100%	157

Table A-21 ILL Librarians: Minimum acceptable fill rate for a national periodicals center, by collection size of responding library

Minimum Acceptable Fill Rate	Collection Size, As Sampled (Volumes)					Total Respondents
	20,000-99,999	100,000-499,999	500,000 and over	Other ARL Members	All Libraries	
90 percent	20%	27%	31%	60%	31%	49
80 percent	7%	44%	28%	20%	29%	45
70 percent	46%	17%	21%	-	21%	33
50 or 60 percent	7%	3%	12%	-	10%	14
Other rate	-	3%	6%	-	4%	7
Don't know	-	3%	-	10%	1%	2
No answer	20%	3%	2%	10%	4%	7
TOTAL	100%	100%	100%	100%	100%	157

Table A-22 ILL Librarians: Preference for subject, frequency of use, language, and currency of materials to be held by a national periodicals resources center.

Periodicals by subject, frequency of use, and language	Current titles			Deceased titles		
	Last 12 months	Last 10 years	Vol. 1, No. 1 to date	Last 12 months	Last 10 years	Full set
Humanities						
• Commonly used titles						
English	1%	15%	64%	3%	6%	66%
Western European language	1%	16%	58%	-	11%	59%
Other foreign language	6%	18%	41%	4%	15%	43%
• Little used titles						
English	4%	22%	55%	3%	19%	55%
Western European language	3%	23%	47%	3%	19%	49%
Other foreign language	11%	17%	38%	10%	14%	40%
Social Sciences						
• Commonly used titles						
English	4%	19%	59%	4%	11%	59%
Western European language	3%	26%	45%	2%	21%	46%
Other foreign language	7%	27%	30%	4%	24%	34%
• Little used titles						
English	2%	30%	52%	4%	21%	53%
Western European language	6%	28%	40%	4%	20%	45%
Other foreign language	12%	22%	30%	10%	18%	35%
Science and Technology						
• Commonly used titles						
English	5%	29%	43%	4%	16%	52%
Western European language	3%	30%	42%	3%	24%	41%
Other foreign language	5%	32%	32%	5%	25%	32%
• Little used titles						
English	5%	33%	44%	6%	22%	48%
Western European language	7%	29%	38%	7%	21%	43%
Other foreign language	10%	30%	30%	9%	23%	35%
Other	-	1%	6%	-	1%	6%

NOTE: Each line totals more than 100 percent. Two responses were allowed per line, one for current titles and one for deceased titles.